MEDICAL LIBRARY

The Journal of the *International College of Surgeons*

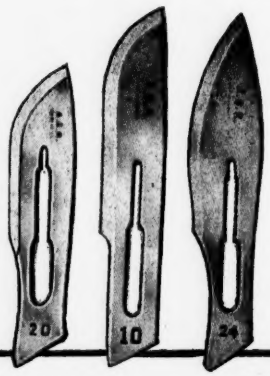
ACADEMY OF MEDICINE, TORONTO
DUPLICATE

COLLEGE INTERNATIONAL DE CHIRURGIENS

Vol. IX *May-June, 1946* No. 3

THE EDGE OF EXPERIENCE

ONE generation teaches another . . . Today's master-surgeon passes on to younger hands his growing legacy of learning. In much the same way, his trusted A. S. R. Blade stems from a proud tradition of professional skill and experience—that of the master-craftsmen whom A. S. R. has trained as lifelong blade-making *specialists*. Men who themselves are heirs to a unique and cherished trust: *our more than fifty years of doing one thing well . . . creating precision edges worthy of the fullest confidence.*



Exacting surgeons specify A. S. R. Blades for important reasons: their correct degree of keenness, assured "feel" and perfect balance. Under every surgical test, "a tool you can trust."

Available in 9 sizes to fit all Standard Surgical Handles.

A.S.R.
REG. U.S. PAT. OFF.

Surgeon's Blades and Handles

SURGICAL DIVISION, AMERICAN SAFETY RAZOR CORPORATION, BROOKLYN 1, NEW YORK

Makers of fine edges for over half a century

Original Articles

Amino Acids in Surgery

CHARLES S. WHITE, M.D., Sc.D., F.A.C.S., F.I.C.S.
WASHINGTON, D. C.

IT is only within the past few years that any serious and sustained effort has been made to determine the protein needs of surgical patients and to supply amino acids or digested proteins orally and parenterally, although Whipple has shown the paramount importance of the role of proteins in the human economy. There must be an approximate balance between the intake and output of proteins in the maintenance of health, the relation being expressed as nitrogen balance.

Man can not, like the plants, synthesize his proteins from the air, the water, and the earth, but must ingest those which he assimilates and distributes to the various organs and tissues of his body. Foods differ greatly in their proteid value, not so much in quantity as in their utilization by the human organism. Milk contains but 3 per cent protein, while gelatin is 90 per cent, yet milk has a higher biological value because over 90 per cent of its protein is made available by digestion, while gelatin undergoes very minor changes and is not converted into amino acid. Each living cell of our bodies contains protein in some form, and there are approximately 1600 complex proteins, entering into the hormones, enzymes, antibodies and other vital constituents.

In the process of digestion, the protein molecule is hydrolyzed into amino acids, which are absorbed from the small intestine through the portal system. It is believed that the liver is the major organ for conversion of amino acids into complex proteins and is the storehouse of amino acids or proteins. It has been said that the liver is the agent, the factory and the bank of the proteins. There are three major types of proteins in the body, namely, the fixed or tissue, the labile or mobile, and the blood protein. There is a dynamic equilibrium that exists between these different groups of proteins and a constant exchange occurs; if blood proteins are lost through hemorrhage or shock, the tissue and labile proteins are drafted to replace the blood proteins and if tissue proteins are depleted, the blood proteins contribute to the reserve of tissue proteins.

In chronic hypoproteinemia, there is a primary loss of the tissue and labile proteins, which in turn makes demands upon the blood proteins, with a consequent decline of serum protein levels. We can expect the laboratory to report the levels either in total proteins or the albumin and globin content separately.

Protein needs can be estimated by measuring the protein metabolism of the body, by analyzing the nitrogen output in the urine and feces and in any pathologic exudate or transudate. Under normal circumstances, the average nitrogen loss per day in the urine is six to nine grams, and the fecal nitrogen is one to two grams. As each gram of nitrogen represents 6.25 grams of protein, the protein loss per day is fifty to sixty grams. Protein deficiencies

* Read at the Tenth Annual Assembly, U. S. Chapter, International College of Surgeons, Washington, D. C., December, 1945.

may be due to one or more of the following factors: (1) inadequate intake, (2) excessive loss, (3) increased metabolism and (4) decreased utilization.

Patients who undergo surgical operations almost invariably have a negative protein balance, or, in other words, the nitrogen output is greater than the nitrogen intake. They have an inadequate intake, particularly those demanding gastrointestinal surgery. Many such patients practically starve one to two days before operation and three to five days afterward. The postsurgical period is associated with an increased destruction of protein, demonstrated by the increased loss of nitrogen. We have frequently noted that preoperatively, patients will have a nitrogen loss per day of six to eight grams of nitrogen, and during the first three to four postoperative days, without protein intake, the loss is twelve to twenty grams, equivalent to 75 to 125 grams of protein utilized by the body.

In a study of a series of twelve uncomplicated cases of inguinal hernioplasty —one of the simplest types of major operations, in which the function of the gastrointestinal tract is rarely impaired —we found all of them postoperatively to be in negative nitrogen balance on routine hospital fare. The average protein weight loss for nine days of study was calculated from the protein deficit to be 4.7 pounds. This was not the actual weight loss, because the carbohydrate and fat loss was not included. The daily deficit in nitrogen was 6.87 grams of nitrogen or 38.38 grams of protein. The total nitrogen deficit was 97.96 grams or 613.97 grams of protein in nine days. Serum protein studies upon the same patients showed an average serum albumin loss of .53 grams during the period of study.

Ravdin furnished proof in his experimental work, which was corroborated clinically by others, that edema obstruction and the disruption of wounds can be attributed to hypoproteinemia.

Kozol reported a 5 per cent drop in the average total plasma proteins in surgical patients after operation. Kastin and his associates found .5 gram loss of protein in 68 per cent of major abdominal operations. In a recent study of 304 operative patients who were hospitalized an average of 15.2 days, Riegan noted an average loss of 6.5 pounds. In 17 abdominal operation cases, she reported a loss of 12.4 pounds.

Add to this protein deficiency that exists postoperatively any preoperative deficit, and one can well understand the need for oral or parenteral protein replacement. The incidence of preoperative hypoproteinemia in surgical patients is far greater than most of us realize. In a study of a series of surgical patients at Gallinger Municipal Hospital, we found on admission that 50 per cent of the lung abscess patients were hypoproteinemic, 33 per cent of the peptic ulcer patients, 34 per cent with cellulitis of the leg, 33 per cent with carcinomata of the stomach, 19 per cent with intestinal obstruction, 16.6 per cent with acute cholecystitis. A 22.3 per cent incidence of hypoproteinemia was found in general surgical patients by Meyer and Kozoll of Cook County Hospital. A careful study of hypoproteinemia by Ariel and his associates at the Memorial Hospital revealed that 59 per cent of cases of gastric carcinoma, 36 per cent of carcinoma of the colon and the rectum and 33 per cent of benign gastrointestinal lesions, had a recognizable hypoproteinemia. In view of the excess protein loss, the inadequate protein intake, and the high incidence of hypoproteinemia in surgical patients, parenteral or oral proteins should play an important part in the

preparation and postoperative care of surgical patients.

This brings us face to face with the question, "Is it necessary to maintain a nitrogen balance in surgical cases?" The answer is not "yes" or "no." In the uncomplicated case, the loss of proteid is temporary and the deficit will be adjusted during convalescence. In the poor risk patient or the case beset by unforeseen complications, maintenance of the nitrogen balance not only is imperative, but the actual difference between success and failure may rest upon the proteids. Alteration in albumin-globulin ratio may become so grave as to be irreversible. It is not difficult to select a group of cases in which we can predict a protein deficit at the time of operation as well as a deficit after operation. We noted fifty cases admitted to the hospital, selected at random, in which 25 per cent were below normal in serum protein. In carcinomatous patients, or those with fistulae, protracted vomiting or diarrhea, we can expect a much larger percentage to show protein deficiency, even to a critical degree. We wish to stress the importance of protein blood level determinations in poor risks and cases to be subjected to prolonged operations.

In 1936, Elman described the use of amino acid solution for parenteral use; subsequently he and others have studied the use of additional oral and parenteral amino acid solutions. We have investigated the use of a protein digest solution which is prepared from an enzymotic digest of a mammalian proteid. The crude digest was purified by a procedure which removes all toxic or otherwise undesirable constituents, maintains the sterility of the mixture and yields a stable, heat-sterilized, pyrogen-free solution and a pH of approximately 6.5. The end product is approximately a 6 per cent solution that contains free amino acids, polypeptide and at least 50 per cent of the nitrogen as represented as free alpha amino nitrogen. No undigested proteins and proteoses are present. Biological studies have shown this preparation to be adequate for nitrogen metabolism and for growth of animals when this is the only source of protein. Each solution contains the following specifications:

	Gm. in 100 cc. of solution
Total solids	6.0
Total nitrogen	0.625
a amino nitrogen (50–60% of the total nitrogen)	0.325–0.39
Ammonia nitrogen	0.004–0.008
Ash	0.85

In 300 consecutive intravenous infusions with this material there were seven reactions, or an incidence of 2.3 per cent. None of these reactions was severe and only two of the seven were systemic reactions attributable to the protein digest used. The other five were proven to be pyrogenic. No acute thrombophlebitis was noted during the period of study and as much as 30,000 cc. had been administered to one patient. Nitrogen balance studies have shown that this protein is utilized by the body for both protein storage and regeneration of blood albumin. The protein digest solution may be used as either a supplemental sparing protein in the postoperative management of surgical cases, or as the sole source of protein. In the latter instance, when given with 10 per cent glucose, positive protein balance can be maintained consistently. Since the average patient needs a minimum of ten to twelve grams of nitrogen in the early postoperative period, twenty to twenty-five grams of glucose intravenously, in addition, will maintain nitrogen balance.

(Continued on page 327)

Exaggeration Phenomena

1. The sudden exaggeration of previously existing symptomatologies or their unexpected precipitation after surgical operations and procedures.
2. The relation of exaggeration phenomena to the anaphylactic and/or allergic mechanism.

ABRAHAM O. WILENSKY, M.D., F.A.C.S.
NEW YORK CITY

THIS communication will discuss certain peculiar and obscure episodes which are encountered from time to time in clinical surgery. Essentially, these consist of an acute or hyperacute exacerbation of previously existing symptoms for which relief is sought by operative and/or mechanical means; or the precipitation of the patient into a state for which therapeutic effort had been made as a preventive measure. The resultant condition immediately becomes of a most serious nature, rapidly assumes the attributes of a highly toxic state and is commonly fatal within a space of days. Up to the present time, no satisfactory explanation has been forthcoming for this most disturbing series of events.

This communication will (1) review the factual knowledge of each of the outstanding examples cited; (2) compare these with each other; (3) compare these with a group of pathologic states which are common and for which an explanation *has* been available for many years; (4) show that a certain similar group of pathologic and/or functional changes are always present in all of these conditions; and, (5) finally, on this basis, attempt a satisfactory explanation of these exacerbation phenomena.

SUMMARY OF PERTINENT FACTUAL CLINICAL KNOWLEDGE

Thyrotoxicosis: * Thyrotoxicosis (exophthalmic goitre, Basedow's disease, etc.) is characterized by a fairly frequent acute, sometimes fulminant onset, by sudden spontaneous exacerbations, or acute recurrences, and, specifically for this discussion, by hyperacute, markedly intensified, postoperative episodes commonly referred to as "crises." All types of thyroid operation done for thyrotoxicosis and, frequently, other types of operation in various other parts of the body done for other reasons in thyrotoxic patients, carry the danger of a subsequent crisis.

The symptoms of a thyroid crisis—those of thyrotoxicosis in general but carried to an excessively exaggerated degree—are well known and need no repetition. There are clinical manifestations of tremendous toxicity and the patients die in hyperpyrexia.

There is abundant evidence (1) that the entire disease including all such episodes is a continuous process (Hertzler's [23] conception) based upon some underlying condition; (2) that all such acute or hyperacute exacerbations, recurrences and crises are due to the sudden release of some factor which acts in a very powerful manner, apparently through the thyroid as a culminating agent and (3) that the sudden release of this factor is in the nature of an antigenic and/or catalytic agent in an already sensitized or hypersensitized individual. In this conception, it seems obvious that thyroid operation in a thyrotoxic individual followed immediately by a "crisis," is, for practical purposes, a laboratory experiment in which a successful "take" has occurred; this is corroborated by the fairly large number of "takes" that follow the operative insult.

The difficulty in understanding this sequence of events is due to the fact that

* This subject was extensively discussed on another occasion.[52]

the pathogenesis of this sequence is rarely made clear by postmortem examination. Nevertheless, it is obvious that such overwhelming disturbances are due to profound blood chemical and nervous changes.

The possible role of infection in awakening thyrotoxicosis is so well recognized as not to be worth mentioning again; certainly almost any infection may bring to light latent hyperthyroidism or may exaggerate the fully developed condition. Rosenow [37] is the only bacteriologist who has claimed to find a specific organism that might produce it; his observations have never received very serious consideration.

The relation of asthma to hyperthyroidism also has been commented upon repeatedly (Fitz [18]). Indeed Widal and Abrami [51] also claimed that the asthmatic hyperthyroid could often be cured of asthma by irradiation of the thyroid gland, another observation which has not received wide confirmation.

Mental shock as a trigger mechanism is always brought up in discussion on the exciting causes of thyrotoxicosis. Bram [5] believed that he had discovered evidence of psychic trauma in 85 per cent of his cases.

Neurological pathways and a neurohormonal cellular system have been demonstrated (Sunder-Plassmann [44]) whereby an excitatory cause could be quickly distributed and bring about acute or hyperacute phenomena (crises). There is further corroborative factual knowledge regarding many similarities between thyrotoxicosis, neurological allergy, epilepsy and certain mental states, especially fear.

In the medical treatment of thyrotoxicosis and in the preparation of thyrotoxic patients for operation, iodine (Lugol's solution) seems to decrease the already existing sensitization of the patient. The occasional uncontrolled contradictory effect which it sometimes causes, is in line with the occasional similar action of other antigenic bodies.

Hepatic changes appear to be an integral part of the syndrome of thyrotoxicosis. This can be demonstrated clinically by the occurrence of icterus; physiologically, by the increasing evidence of altered hepatic dysfunction; experimentally, by the evidence of hepatic dysfunction following administration of thyroid substance and thyroxin; and morphologically by structural changes in the liver, varying in the acute stages from widespread degenerative, fatty and necrotizing processes to the chronic lesion in which the changes are interlobular, irregularly distributed, involving the peripheral portions of the lobule and showing relatively more fibrosis and lymphatic infiltration than bile duct proliferation.

HEPATIC CONDITIONS; HEPATO-RENAL SYNDROME

There are various pathological conditions in the liver parenchyma which are independent of obstruction at the outlet of the duct system, the manifestations of which include jaundice, gastrointestinal symptoms, changes in hepatic function and secondary renal changes. Sometimes one is sure that a "medical" condition is present; at other times there is doubt and a "surgical" condition is suspected without possibility of complete proof. When exploration is undertaken and no adequate "surgical" cause is found, no further procedure is done and the abdomen is closed. In other similar cases, it is a fairly common practice to attempt to relieve or cure the condition by biliary drainage either into the gall bladder or into the common or hepatic duct.

Commonly such operations lead to no

therapeutic affect and the postoperative course repeats that which had been previously present. In any event in certain not so-small groups, there follows almost immediately after operation, an increase in the symptomatology with shortly, an unexpectedly severe exaggeration of the latter and a rapidly fatal outcome. These effects appear when no drug (i.e., anesthesia with ether, etc.) or other toxic agency had been exhibited; and when the only new factor has been the deprivation of fluid and food necessary to preparation for operation and in the immediate postoperative period, plus the operative manipulations.

The outstanding demonstrable factors discernible in this sequence of events include destructive changes in the liver parenchyma with abnormal liver function, secondary renal changes, and in some cases, hyperpyrexia. The entire subject has been extensively reviewed by me (Wilensky [53]) recently under the general term of the "Hepato-renal syndrome." No other changes can be recognized in these cases; one must assume that under the stress of the operation, some factor has been released in the hepatic environment which has the exaggerated effect of a "catalytic" agent with extraordinary distribution effect.

SUDDEN RELEASE OF OBSTRUCTION

Typical forms of obstruction to the outflow of the fluid and/or solid contents of a hollow excretory passageway, are well known as regards the biliary, the urinary and the alimentary tract. A curious antithesis exists in all cases of obstruction; trouble begins and develops because the obstruction is not relieved; occasionally an exaggerated form of the same abnormality and disability is precipitated when the obstruction is more or less suddenly relieved.

1. *In intestinal obstruction:* The phenomena of intestinal obstruction are well known including their clinical manifestations. There is the much more severe and dramatic high intestinal form, and a low intestinal variety of a much slower and more sluggish type. The dangers are enormously increased when vascular changes due to strangulation of the bowel are present; then the clinical manifestations are of a much higher order. If the condition is neglected, necrotic areas form, perforation of the bowel follows and the patient dies of terminal peritonitis.

The earliest instance which Elman [16] could find of death following close on the sudden release of intestinal obstruction was reported in 1887 by Schede.[38] Similar cases were described by Briddon [6] in 1893 and by J. B. Murphy [32] in 1897; others have been reported since. A recent example was reported by Heusser and Schar.[25]

The rapid sequence of events follows even in some of the mildest of attacks, as illustrated in one of my own cases.

This was a young child with an intussusception of between 12 and 18 hours' duration. Release and reduction of the intussusception was the simplest of procedures and took only a few minutes. Nevertheless the reaction was overwhelmingly violent and was fatal in less than twenty-four hours.

Parenchymal changes are frequently present in the liver, especially in severe cases; renal changes are then present also (hepatorenal syndrome). In either case, the changes follow the destructive characteristics (cellular necrosis) noted in the latter syndrome; their intensity becomes progressively higher as the site of the obstruction ascends in the alimentary canal. There is usually present some degree of azotemia and the level of the latter can be used as a rough indication of the intensity of the disturbance

caused by the obstruction. In the fatal cases, spontaneous or postoperative, all of these anatomical and functional changes are exaggerated.

Following the spontaneous or operative release of the obstruction, there is customarily a quick reversal and return to normal conditions. Nevertheless, there occasionally follows after operation, an immediate and rapid exacerbation of the preceding picture with precipitation into an overpoweringly fatal toxic state with terminal hyperpyrexia. This occurs in well operated cases in which as a usual finding there is no peritonitis or other sign of infection, usually in cases in which no resection has been done, and in which the sudden flare-up is more or less unexpected.

The suddenness of these exaggeration phenomena after release of the obstruction, indicates the sudden appearance of some "new" factor of overwhelming catalytic effect with remarkable capability for rapid and diffuse distribution.

2. *In calculus renal obstruction:* More or less sudden obstruction by calculi in the urinary tract on one side, is commonly followed by restriction in the urinary secretion of the corresponding kidney up to the point of complete suppression. In the presence of bilateral formation of stones, similar disturbances of function may follow. One considers operative removal of the obstructing calculi with concern. The patients are always carefully studied prior to operation; one assures oneself that the function of at least the better kidney is sufficiently good to warrant, at least, a unilateral operation.

Usually operative removal of the stones, even on one side only, is followed immediately, or reasonably soon, by the reappearance of, or increase in the urinary function, up to the total functional capacity of that kidney at the given moment. Occasionally, however, a state of complete suppression of urine follows the operation; the preoperative condition is suddenly intensified to the point of complete anuria; that is, all the manifestations of the obstructive state are suddenly exaggerated after release of the obstruction. The episode is all the more striking when a unilateral operation only is done in the presence of bilateral disease.

Postmortem examinations reveal the pathological conditions in the kidneys, as one supposed them to be as a result of one's examinations and operative visualization. Occasionally, there are parenchymatous changes in the liver. But aside from this and some cardiovascular changes, nothing is uncovered adequately to explain the postoperative events. One is left then with the assumption that some factor was released during the operative manipulations which acted upon the renal parenchyma, possibly as a catalytic agent, to suppress the secretion of urine.

3. *In common duct obstruction:* In calculus and/or other obstruction of the common bile duct, the usual clinical, chemical and anatomic changes are well known. There is abundant evidence in the literature, as has already been indicated, to the effect that the hepatorenal syndrome and/or lesions in the subacute and/or chronic form develop in conditions of the liver and biliary tract for which no kind of operation has been done and especially in cases in which there has been no demonstrable spontaneous release of the obstruction. Frequently these anatomical changes and functional disabilities are not recognized in the total clinical picture. Operation, nevertheless, is usually followed by reversal of the symptoms and anatomical and functional changes, and recovery of the patient.

However, following operative release

of the obstruction, it sometimes happens that all of the preceding preoperative manifestations are suddenly intensely exaggerated, including the jaundice and excretory disability of the liver. Indeed, sometimes the picture approaches the complex known ordinarily as "acute yellow atrophy."

The precipitation of the patient into a highly toxic and fatal state so soon after the release of obstruction by operative means (that is, sudden release) makes the conclusion inescapable that the syndrome has some definite relation to the suddenly produced static and/or physiochemical conditions which follow the release of the obstruction.

TOXEMIA OF PREGNANCY

During labor, the uterus and its contained products of conception act in a similar manner to an obstructed biliary, urinary or intestinal tract; as such, the uterine contents during labor act as the obstructing factor; the emptying of the uterus spontaneously or by operative methods, relieves the "obstruction."

The phenomena surrounding toxemia of pregnancy have been previously reviewed. With pregnancy, too, it is well known either (1) that the manifestations of the already existing toxemia may be markedly exaggerated, or (2) that the patient may be precipitated into toxemia, when the products of conception are rapidly evacuated from the uterus. Even though it is understood that relief of the toxemia necessitates emptying of the uterus, the latter procedure is approached with much trepidation because of this danger.

On an anatomical basis, two varieties are clinically distinguished:

In one group of cases, scattered areas of hepatic lobular necrosis appear with some frequency in pregnancy complicated by "toxemia." (It is to be noted that in pregnant patients, necrosis of the hepatic cells begins in the periphery of the lobule and increases progressively toward the center, whereas in nonpregnant patients presenting the hepatorenal syndrome, the cellular necrosis begins in the center of the lobule and spreads toward its periphery.)

In other cases, typical toxemic states follow glomerulonephritis, pyelitis, pyelonephritis or vascular hypertension which, in turn, is associated with secondary nephritis. According to Peters [34] the demonstrable anatomical changes have certain features which distinguish these lesions from the ordinary acute nephritis.

Pathological changes in the liver, as well as functional impairments, seem, superficially, to be unrelated to renal or cardiovascular conditions. When the hepatic changes become severe, they approach the picture of "acute yellow atrophy"; when one considers the frequency of associated renal changes in this severe form, as indicated in a previous communication (Wilensky [53]), one must assume that some association is always present between the liver and the kidneys.

Immeasurable millenia of child bearing have accustomed women, and for that matter all female animals, to certain detrimental physiological bodies which undoubtedly form in the uterine environment, one of the outstanding recognizable effects of which is a disturbance in the cholesterol metabolism and the precipitation of stones in the biliary tract. Because mild manifestations occur in many instances (e.g., vomiting of pregnancy), and become exaggerated to various degrees, up to full blown cases of toxemia of pregnancy in a relatively few instances, it must be true that some sensitization occurs in all, and hypersensitization in a few. If one accepts this, it must follow that toxemia will sometimes result in the

latter group; that precipitation into a toxemic state following evacuation of the uterus is a catalytic phenomenon in a hypersensitized individual.

COMMON ASSOCIATED FACTORS IN THE PREVIOUS CITATION

Inasmuch as some form of operative and/or mechanical manipulations occur in all of these conditions, it becomes important to consider three factors, (1) shock, (2) the effect of destroyed tissue and (3) hyperpyrexia.

Shock: In all forms of shock, one can recognize (1) an immediate (primary) form frequently so severe as to cause immediate death and (2) a delayed (secondary) form which develops during the first 48 to 72 hours after the appearance of the cause. Primary shock is characterized by sudden very great vascular collapse, as its most prominent effect. In secondary shock, the manifestations, while essentially the same, are very much less dramatic. The following forms can be clinically distinguished:

A. Neurogenic shock, either as a psychic phenomenon or following some injury;

B. Traumatic shock produced by civil or military injuries or operative procedures;

C. Following hemorrhage; this intensifies the vascular phenomena of shock in general;

D. Hemolytic shock most commonly seen after transfusions of blood;

E. Toxemic shock.

In all forms of shock other factors commonly enter the picture. These include (a) the action of toxic bodies absorbed from traumatized and destroyed tissues, (b) the toxic effect of laked blood and (c) neurogenic factors. The toxic effect of traumatized muscular tissues and of laked blood have been demonstrated in experimental animals. In animal experiments, shock produced by traumatizing a limb does not appear until the tourniquet is removed; during World War I an English research committee found that traumatic shock did not occur in the dog if the vessels of the extremity were clamped before the injury was inflicted.

The anatomic changes following hemolytic shock are especially interesting; in Malijsev's[29] patients and experimental animals there were the usual signs of hemolysis. In addition, when death was delayed for any length of time, there were degeneration of the epithelium of the renal tubules and necrosis in the centers of the hepatic lobules. According to Malijsev,[29] Skundina[42] and Elanskij,[15] such changes are not to be attributed to mechanical obstruction alone, but rather to an anemic condition of the organs, spasm of the capillaries and toxic action of the products of decomposition of hemoglobin.

Hesse[24] and his school subdivided the mechanism of hemolytic shock into four parts, (1) nonspecific protein reactions of varying intensity, (2) hemolytic shock and its sequelae, (3) intoxication of the organism by denatured proteins occurring in preserved blood and (4) anaphylaxis.

Petroff[35] and Iljin[26] have shown that the toxic effect of heterogenous blood is related to its protein content. The introduction of either erythrocytes or plasma into the blood stream of experimental animals is followed by especially marked toxic effect; the toxic substances being similar to the complicated protein components of adenosin phosphoric acid.

According to Pannella,[33] shock is an anaphylactic state caused by absorption of albuminous material from destroyed tissues.

Nervous factors in traumatic shock: The observations of Slome and O'Shaughnessy,[43] Freedlander and Lenhart,[19] Blalock,[3] Cicardo,[8] Swingle *et al.*,[45] Eversole,[17] etc., lend support to the

view that neurological factors have an important part in the causation and course of traumatic shock. The latter explains some of the apparently contradictory results obtained in experiments in which peripheral nerves or central pathways have been interrupted without influencing the onset and development of shock. Further, they introduce the new concept that certain neurological factors may not act to favor the development of shock but, conversely, to increase the resistance against circulatory collapse; their influence is thus much more complex than that which results from harmful nociceptive impulses.

Effect of destroyed tissues: Of the various forms of tissue, destroyed muscular tissue has the highest toxic potential. The studies of Wangensteen and Waldron [48] showed that pieces of the pancreas, the liver and intestines are the most toxic; renal tissue is relatively nontoxic; splenic tissue is intermediate in toxicity. Intestinal, pancreatic and hepatic tissue appear to disintegrate into toxic bodies more quickly than do renal and splenic tissue. The size of the autolyzing piece of tissue is also important, as Boyce and McFetridge [4] pointed out. The injected substances prepared from the various tissues (Andrews and Hrdina [1]) appear to be about equally toxic, except that there seems to be an early qualitative difference in the toxicity of the autolyzing tissue, in accordance with the rapidity of disintegration and liquefaction. With transplants of hepatic tissue, Mason and Nau [31] have noticed differences in accordance with the point from which the transplants are taken.

Helwig and Orr [22] emphasized resemblances seen in this anatomic picture to that observed in the presence of eclampsia. The bulk of the experimental evidence, however, shows that death is primarily due to a toxemia of maximum grade. The evidence shows that the toxin is produced in the process of autolysis of the implanted tissue in the experimental animal or the destroyed and/or necrotic tissue in the human being. According to Andrews and Hrdina,[1] the toxic agent is a water-soluble, thermostable body which is precipitable by alcohol or chloroform, stains purple in solution when the biuret test is used, is dialyzable only with difficulty and probably falls within the albumose group.

Important essential anatomical changes are noted in the liver and in the kidney:

1. The cells of the central and middle zones of the liver lobule show rarefaction so marked that the nuclei of the cells appear to be held in place by a lace like web. The cells of the peripheral zones have a fine, foamy appearance. The tissues of the portal canals are infiltrated with lymphocytes, endothelial cells and an occasional polymorphonuclear leucocyte. The infiltration is most marked around the bile ducts. The liver is the victim of what appears to be a rather acute and marked fatty degeneration plus a septic cholangitis.

2. The lesions in the kidney vary with the different fields. In some fields, the capillaries of the tufts and tubules are engorged with red blood cells, the tufts are swollen until they fill the subcapsular spaces, the tubular epithelium is swollen and the inner margins are frayed. The lumen contains granular debris. In other fields, the glomerular tufts are approximately normal in size, leaving a fair subcapsular space. The tubular epithelium shows some erosion, but also many of the cells show a brush like border. The kidney appears to be recovering from a rather intense, toxic parenchymatous nephritis; the cause of the condition seems to be still operating, though in lessened intensity, as is shown

by the areas of present, acute nephritis.

Burns: An outstanding example of the effect of destroyed tissue occurs in burns. The clinical facts and pathological anatomical changes in this form of thermal injury are as follows: there is an immediate intense systemic disturbance, customarily termed "shock." Death results either immediately or within the first twelve hours; it may occur after various grades of burns up to those of largest extent. Hyperpyrexia is frequently present. The initial period, in those who survive, is followed by a second period in which the clinical phenomena and laboratory data indicate a form of toxemia. Death also occurs frequently in this period.

The postmortem studies made by Agnes MacGregor [28] (one of Wilson's group) showed characteristic changes in the liver in cases of death after burns. Areas of necrosis occurred in the centers of the lobules of the liver, with fatty degenerative changes. The tubules of the kidneys also showed degeneration, but the changes were less severe and less constant than were those in the liver. In some instances, there were similar changes in the brain cells. In Weiskotten's [50] cases, hemorrhages occurred in the adrenal glands, and in Bardeen's [2] cases there was so-called focal necrosis in the lymphatic tissue.

According to Duval,[14] the clinical picture, the humoral changes and the local (cutaneous) and visceral lesions observed in the human being, when considered in the light of the results of animal experiments, lead to the conclusion that this phase of intoxication or toxemia is general and is due to absorption of toxic products formed in the burned area.

The manifestations in the first four days after a severe burn resemble greatly three other types of toxemia which physicians are beginning to understand, traumatic shock following severe injuries and the intoxications accompanying roentgen therapy or Curie therapy.

Similarity to the hepatorenal syndrome is striking. There are, first, the occurrence of death with hyperpyrexia in the first few hours after the reception of the burn, corresponding to the so-called liver death and second, death as a delayed phenomenon with the clinical signs of toxemia, corresponding to the deferred death following the hepatorenal syndrome.

In animals it has been found that repeated burns confer sensitization, which in turn confers a certain immunity or resistance toward burns.

HYPERPYREXIA *

A characteristic manifestation in most, if not all cases of exaggeration phenomena, is hyperpyrexia. Hyperpyrexia has been correlated with the concept of "liver-death." Such extraordinary fever occurs in many diverse conditions of which the following are examples:

1. Following operation upon the biliary tract;
2. Following resection of the rectum for malignancy (Crisp [10]);
3. Following interval appendectomy, hysterectomy or laparotomy for ovarian cyst (Connell [9]);
4. Following colostomy (De Courcy [12]);
5. Following resection of the cecum and in association with carcinoma of the pancreas with liver metastases (Boyce and McFetridge [4]);
6. Following release of an intussusception (Wilensky [53]);

* Death in hyperpyrexia occurs also as a dramatic event in non-surgical disease, as, for instance, in medically treated thyrotoxicosis, in thymus death, in hyperacute forms of meningitis, etc. Except as they contribute pertinent facts to the subject of this communication, these are not included.

7. Following an exploration for obstruction of a Polya type gastroenterostomy;
8. After thyroidectomy;
9. After burns.

Cases of high temperature death are especially disconcerting. In these cases, one begins usually with a patient who is in good condition. Operation usually proceeds without any alarming occurrence. Then comes an immediate and progressive rise of temperature; disturbances of the sensorium quickly pass on to lethargy and coma; signs of excessive nervous irritability (carphologia and subsultus tendinum) appear; the patient is obviously very sick and then moribund and death occurs within from twenty-four to forty-eight hours.

At postmortem examination, the important findings seem centered in the liver and in the kidneys. The hepatic cells show signs of disorganization or beginning destruction; commonly the kidneys show some congestion; not uncommonly similar degenerative changes are seen in the renal cells. However, in many cases in which such symptoms were present before death, there were in addition evidences of infection (subphrenic abscess, subphrenic peritonitis).

For instance:

A young man was admitted to the hospital with a diagnosis of "chronic appendicitis," and an appendectomy was done. During the next thirty-six hours, his temperature rose to well over 106° F.; there were marked signs of toxicity and death occurred. Postmortem examination showed peritonitis, distinctive but yet in an early stage of development and inconspicuous changes in the hepatic and renal cells.

The interrelationship of infection, hyperpyrexia, parenchymatous destructive hepatic lesions, hemorrhage and shock is a real one. Recently several cases reported by Thomas and Leiphart,[46] illustrate this very well:

In each of the cases, there was an onset with symptoms of a mild infection of the upper respiratory tract. Then there was a sudden, overwhelming exacerbation with symptoms of hyperpyrexia, diffuse hemorrhages in various parts of the body, shock and a rapid continuation until death about 36 hours later.

The pertinent anatomical changes found at the postmortem examination included hemorrhage, marked changes in the liver cells with similar changes in the renal tubular cells, and adrenal hemorrhage.

According to Thomas and Leiphart,[46] the syndrome of severe sepsis with hemorrhagic phenomena is found in cases in which the meningococcus is the etiologic agent. Adrenal hemorrhage is thought to be merely part of the generalized bleeding diathesis and is not concerned *per se* with the rapid death. The status of the thymolymphatic system plays no part in adult cases.

Bacterial allergy: Allergy occurs in a large number of bacterial and parasitic infections and can be demonstrated by skin reactions which are specific only for some; it is probably caused by some cellular protein substance or by the products of cellular metabolism. Even though the reaction is frequently a nonspecific one, the evidence suggests that, with chemically pure antigens, specific allergic reactions would be obtained much more frequently.

COMPARISON OF EXAGGERATION PHENOMENA TO ANAPHYLACTIC AND/OR ALLERGIC CONDITIONS

Physiology and pathology of anaphylactic reactions: In laboratory animals, anaphylactic shock produces somewhat different results in accordance with the species of animal. That which most closely approaches the human form, is found in the dog.

Weil (1917) [49] found that in dogs dying within one hour, the liver dominates the pathological picture. The organ is tremendously enlarged. Its color is intensely cyanotic and the cut surface bleeds freely. Mechanistically, spasm of the hepatic venules (Simonds, 1923) [40] is followed by markedly increasing engorgement of the liver and collapse of the inferior vena cava with a concomitant rise in portal blood pressure, cardiac failure and hemorrhage from the bowels. The pancreas, suprarenals, kidneys and spleen may show congestion. Microscopic section corroborates the changes in the liver. Besides intense congestion, the parenchyma cells show varying degrees of congestion and hemorrhage, cloudy swelling, and if the shock is severe, a disseminated necrosis. The hepatic lesion and its consequent effect is accompanied by alterations in the coagulability of the blood and other evidences of altered hepatic function.

The observations of Manwaring (1910),[30] Voegtlin and Bernheim (1911),[47] Deneke (1914),[13] Weil [49] and Simonds (1925) [41] seem to confirm the fact that the postmortem appearances correspond in general with those of surgical shock and that exclusion of the liver in experimental animals eliminated the shock altogether.

There is evidence in addition that man may die from a canine form of anaphylactic shock, which was suggested in the case report of Gurd and Roberts,[20] proved by the classical case of Dean [11] and by the case of Bullowa and Jacobi.[7]

Because the liver seems to contain the greatest amount of injury at postmortem examination, Weil [49] was convinced that anaphylactic shock is a cellular reaction and not a humoral one, because there is no demonstrable toxic substance in the blood during anaphylaxis and because the site of the reaction is the parenchyma cells of the liver. The other demonstrable changes, due to their relatively minimal characteristics, are without doubt secondary to the liver effect.

The many theories that have been voiced to explain this phenomenon include an increase in the products of protein disintegration, increased mobilization of proteolytic enzymes, reduction in blood platelets, diminution of thromboplastin, excess of antithrombin, decreased fibrinogen, decreased prothrombin, increased amount of heparin, histamine intoxication and other items. The interesting thing is that the common denominator of all of these is anatomical and/or functional *changes in the liver parenchyma.*

Physiology and pathology of allergy: The phenomena of allergy in general have a basis similar to that seen in the anaphylactic reaction. In the anaphylactic cases, the basis is acquired artificially by injection; in allergy, the basis is a tendency acquired naturally by inheritance and is not directed to any specific antigen. In anaphylaxis, definite precipitins have been demonstrated in the blood; Prausnitz and Kustner [36] have found specific bodies in the serum of allergic individuals.

In clinical practice, the potential allergic tendency is brought to its active stage by a specific antigen; the subject then becomes sensitized. The available antigens are legion in number and include, most commonly, protein bodies and, less commonly, other organic substances and drugs, and many other materials. Even physical conditions, such as cold, heat and light may be responsible; the importance of emotional factors acting along neurological pathways is very great. The failure to produce allergic responses is undoubtedly due, in these naturally acquired tendencies, to equally naturally acquired tolerances and to a time and quantity relation.

Regarding the usual clinical manifestations in allergy, suffice to say that they continue for long periods of time. The anatomical changes associated with these are difficult to discover because the subjects do not necessarily die of the allergic condition, but commonly as a result of other intercurrent disease whose pathological-anatomical basis would tend to obscure the effects of the allergy.

Nevertheless, Hartley and Lushbaugh [21] have shown in laboratory experiments that massive areas of coagulation necrosis of the liver parenchyma were produced by repeated injections of protein material in sensitized and in hypersensitized animals. The local union of antigen and antibody is responsible for these responsive manifestations; vascular changes are secondary to this. The lesions were focal—midzonal, peripheral or central in the liver lobule.

DISCUSSION

It must seem obvious from all of the preceding facts, that more than one cause or set of causes may initiate a mechanism which would produce these characteristic exaggeration phenomena.

The factual résumé reviewed here contains the following common denominators:

1. A surgical procedure (operation, labor, etc.). This is accompanied by (a) hemorrhage, (b) loss of fluid, (c) shock, (d) excessive nervous stimulation, etc. In each case the surgical procedure includes the operative traumatization of practically all varieties of tissue (skin, connective tissue, muscle and some form of glandular tissue). Traumatization of tissue is always accompanied by some degree of destruction of the latter; the importance of this has been indicated in the previous part of this communication. (*Vide supra:* effect of destruction of tissue.) Lymphatic spaces and vessels are opened widely, giving abundant opportunity for the introduction and dissemination of any form of toxic body.

2. The sudden exaggeration of previously existing symptoms; or their unexpected precipitation into the clinical picture. Clinically, these exaggeration phenomena are characterized by (1) their unpredictability, (2) their unexpected appearance, (3) their rapid development, (4) their overpowering effect, (5) their involvement of the entire organism and (6) the frequently fatal outcome.

Each variety of disturbance has been known under different terminologies, such as postoperative cholemia, postoperative thyroid crisis, etc. But up to the present time their significance has not been properly recognized in clinical medicine and surgery, but has been hidden under these nondefinitive terminologies.

All of these exaggeration phenomena seem to have many things in common with the manifestations of "shock." In a surgical sense, the term "shock" is not so very well defined; it is frequently diversely characterized and differentiated by any or all of the following: hypothermia, hypotension, hemoconcentration, capillary permeability, hypocromia, acidosis, depression of the nervous system, etc. Primary surgical shock is sudden and is accepted as being due to nervous stimulation. Secondary shock is due to intoxication with endogenous substances.

The term "collapse" is also used in a surgical sense for somewhat similar effects produced under similar provocation. However, there seems to be not much mechanistic differentiation between collapse and shock, because even nerve impulses are now thought to be due to humoral substances; the pathological and biochemical changes are the same in either.

In anaphylaxis and/or in allergy, the term "shock" indicates the sum total of all the phenomena elicited by sudden exposure to stimuli to which the organism is quantitatively or qualitatively not adapted. This is Selye's [39] conception of the "alarm reaction." This conception is most interesting and offers some explanation for the exaggeration phenomena. He divides the entire symptomatic and biological complex as follows: the first stage of these phenomena is the "alarm reaction," the manifestations in this stage representing and indicating danger or "shock" and signs of active defense. The second stage is the stage of resistance. Sometimes the signs of the first stage are missing because the stimulus is not sufficiently strong or sudden and only counter-shock phenomena (i.e., the signs of the second stage) become evident. The third or final stage is that of exhaustion.

During the counter-shock or second stage, there is increased resistance especially marked to the evocative stimuli, but there is also "cross-resistance" to other damaging agents. In other words, this experience confers a certain amount of nonspecific resistance and is probably related to nonspecific therapy.

The pathological changes which Selye [39] notes in these alarm reactions are also common to anaphylactic and/or allergic conditions. These are as follows:

1. *The liver:* Interest centers in the prevalence of an hepatic degenerative parenchymatous lesion. The liver "shows cloudy swelling and decrease in size which may be accounted for by decrease in blood volume. It may, however, show more extensive degenerative changes with focal necroses sometimes accompanied by intense fatty infiltration which Leblond [27] and his associates consider to be typical symptoms of the alarm reaction belonging to the group of changes which are prevented by adrenalectomy."

In various conditions, the localization of the cellular degeneration in the hepatic lobule has varied from the center of the lobule to its periphery. This may be an accidental distribution of the action of the causative toxic body; it may depend on other circulatory changes or it may be of no biologic importance. The essential fact, however, is that degeneration of hepatic cells does occur. In clinical practice, a breakdown can take place in persons whose hepatic structure and function had previously been apparently normal, or, perhaps more probably, in persons in whom some hepatic damage had already existed as a fully recognized or as a suspected or unsuspected latent condition.

2. *The thymus:* Selye [39] describes very conspicuous changes in the thymus during the alarm reaction which he calls "accidental involution" and which become most pronounced during the counter-shock (second) stage. It seems to be related to the hypertrophic changes in the adrenal. Removal of the adrenals prevents the involution of the thymus.

3. *The adrenals:* The adrenal reaction is characterized by hypertrophy. This is described as a specific result of burns, infectious disease, drug intoxication, ultra-violet ray treatments, etc. In the counter-shock or second stage period, the adrenal cortical hormone plays an important part and distinct counter-shock phenomena do not appear in experimental animals in the absence of the adrenals.

4. *The hypophysis:* The hypophysis is obviously involved since increase of adrenotropic hormone is necessary to produce the characteristic cortical hypertrophy. The thymus involution effect is also controlled by the adrenal cortex.

Other anatomical changes are fre-

quently noted (Selye [39]). They have a rather wide distribution, are commonly seen in other pathological states and conditions, and, possibly, they should be excluded from this discussion as being either not important or of no relation to the subject.

5. *Pancreas:* acute involution;

6. *Gonads:* atrophy;

7. *Blood:* changes;

8. *Gastrointestinal ulcers:* similar to erosions in shock, or following burns, or solar intoxication or low oxygen tension;

9. *Lymph nodes* and *spleen*—as markedly affected as thymus;

10. *Pulmonary hyperemia.*

Physiologically and functionally the basal metabolism is decreased. The blood sugar first rises, then falls, later rises again when protective measures appear. There are changes in the lactic acid and lipid metabolism; lipids appear suddenly in the liver. The latter, with decrease in the blood clotting time, seem to indicate important changes in the liver physiology. There is an immediate discharge of adrenalin associated with loss of chromaffin granules.

The exact cause is still in doubt. Most workers believe that a toxic metabolite is released from the damaged tissues into the blood stream and acts as the mediator. Probably this is brought about by a second mediator—*not always the same*—which causes the release of the other toxic metabolite. Much work points to histamine as the possible causal agent in this first body, irrespective of the evocative cause. Other theories include acapnia, fat embolism acidosis, constriction of the hepatic vessels and nervous exhaustion. All of these, however, are probably symptomatically incidental in the total disturbance to the essential cause and mechanism.

This alarm reaction or theory furnishes a satisfactory explanation for similarities in the clinical symptomatologies of numerous clinical conditions in which these phenomena appear.

Increased resistance in the countershock stage involves a power of adaptability. During the resistance stage, when the organism acquires a high degree of adaptation to the evocative agents, it becomes especially unable to adapt itself to other damaging agencies. Adaptability is therefore limited and is recognized by the phenomena of the stage of exhaustion, when the evocative agent becomes damaging again.

The "adaption energy" concept of Selye [39] is important because it helps us to understand the basic operation of the protective mechanisms and their eventual exhaustion, so that untoward, unpredictable and unexpected phenomena appear.

SUMMARY AND CONCLUSIONS

Exaggeration phenomena occur in many diverse conditions with some modification in results in accordance with the site of the essential organ involved. Otherwise, the symptomatology follows a rather similar pattern. The demonstrable pathological-anatomical changes are very similar and correspond fully with those seen in anaphylactic and/or allergic disease.

In applying all of this factual knowledge, it appears that the production mechanism of the exaggeration phenomena is essentially that of the Arthus phenomenon. Over many years, sensitization of the individual and counter-protective measures are built up concomitantly; and, because the individual evocative cause in each experience is very small and not suddenly applied, all of this is unrecognized by the individual or his physician. It must surely be also true that some form of latent hepatic or other disease is eventually present also.

The alarm conception of Selye [39] helps in understanding the development of the disturbances; the initial attack (first stage), the stage of defense and resistance (second stage), and, ultimately, the stage of exhaustion. Because of their constantly found association, the liver changes seem of great importance, especially since they are frequqently of a latent character; and there also are other changes in the thymus, adrenal, etc.

Comes then an unusually powerful evocative stimulus—an operation, a delivery or the like. Exaggeration phenomena follow unexpectedly. The immediate cause for the appearance of the latter is the unusual intensity and suddenness of application of the evocative cause, which is much more than the protective capacity of the individual is equal to. Under such conditions, the first (danger or shock) stage, and the second (counter-shock) stage, are passed through with extraordinary rapidity; the third stage (stage of exhaustion) is reached, bringing with it collapse of all protective functions and activities with quickly overpowering effect. Not many "make the grade" then. In the others, a fatal termination ensues.

The evidence seems overwhelmingly in favor of the concept that exaggeration phenomena must be classified, at least as far as their pathogenetic mechanism goes, with the anaphylactic and/or allergic group of phenomena.

SOMMAIRE ET CONCLUSIONS

L'éxageration de phénomènes survien avec certaines modifications déterminées par l'organe essentiel lésé. Les changements pathologiques et anatomiques ressembleut et correspondent â ce qu'on observe dans l'anaphylaxie et l'allergie.

Dans le cours des années, la sensitization de l'individu, et aussi des mesures contre-protectives se dévelôppent dans l'organisme concurremment. En présence d'un excitant évocatif très puissant telles qu'une opération, un accouchement, une brûlure étendue une exagération des phénomènes surviendra inopînément. La conception d'alarme de Selye nous éxplique cela. Selye décrit trois stades de dérangement; l'attaque initiale, la défense et la résistance et vers la fin l'épuisement. Un excitant violent peut faire passer les deux premiers stades presque inaperçus le troisième peut revêtir, l'image du choc chirurgical. L'auteur nous dit que le foie est premièrement et très évidemment attaqué, dans ces reactions que ces réactions soient fatales ou non.

RESUMEN

Los llamados fenómenos de exageración ocurren en diversos estados patológicos, con algunas variaciones de acuerdo a la localización del órgano esencialmente afectado. Las modificaciones anatomopatológicas demostrables son muy similares y corresponden a las observadas en las afecciones anafilácticas y enfermedades alérgicas.

Con el transcurso de los años se produce la sensibilización del individuo y conjuntamente la instauración dentro de su economía de procesos defensivos y protectores; ahora bien, si se presenta un estimulo extraordinario, tal como operación. parto o quemaduras graves, entonces, de un modo inesperado pueden producirse fenómenos de exageración. Ello puede explicarse por el concepto de "alarma" de Selye, quien describe tres fases de alteración: el ataque inicial, la defensa y resistencia y, finalmente, el agotamiento. Un estímulo demasiado violento puede hacer que los dos primeres periodos de esta triada pasen

desapercibidos y se entre directamente el el tercero o fase de colapso, semejando el cuadro del "shock."

El autor observa que el hígado muestra signos de ser el órgano que primero y más fuertemente se afecta en todos los tipos de reacciones, ya sean fatales—como ocurre generalmente—o no.

Свод и заключение.

Феномен преувеличенной реакции встречается в различных условиях, и его модификации зависят от локализации вовлеченного органа. Демонстрированные патологическо-анатомические изменения очень подобны и соответствуют изменениям, наблюдаемым при анафилактических и аллергических болезнях.

В течении лет совместно накопляются в организме индивидуальная сенситизация и противо-защитные меры; затем случается необыкновенно сильный вызывающий стимул, как операция, роды или сильный ожог, и неожиданно следует феномен преувеличения. Это можно объяснить на основании концепта тревоги по теории Seyle, который описывает три стажа расстройства: первоначальную атаку, защиту и сопротивление и, наконец, истощение. Очень сильное возбуждение может заставить первые два стажа пройти так быстро, что они почти незаметны, и тогда третий, стаж изнеможения, дает картину "шока".

Автор наблюдает, что во всех этих реакциях печень дает доказательства ее первичного и очень сильного вовлечения, независимо от того являются ли эти реакции смертельными или нет.

REFERENCES

1. Andrews, E. and Hrdina, L. Surg. Gynec. & Obst. **52**:61, 1931.
2. Bardeen, Johns Hopkins Hosp. Rep. **7**:137, 1899.
3. Blalock, A. The Probable Cause for the Reduction in the Blood Pressure Following Mild Trauma to an Extremity. Arch. Surg. **22**:598, 1931.
4. Boyce, F. F. and McFetridge, E. M. So-called "Liver Death": Clinical and Experimental Studies. Arch. Surg. **31**:105, 1935; Autolysis of Tissue in Vivo: Experimental Study with Its Clinical Application in the Problem of Trauma to the Liver. Ibid. **31**:977, 1937.
5. Bram, I. Psychic Trauma in Pathogenesis of Exophthalmic Goitre Endocrinology. **11**:106, 1927.
6. Briddon, C. K. Ann. Surg. **17**:341, 1893.
7. Bullowa, J. G. M. and Jacobi, M. Arch. Int. Med. **46**:306, 1930.
8. Cicardo, V. H. Mecanismo del choque traumatico experimental. Semana Med. **15**:2, 1944.
9. Connell, F. G. Ann. Surg. **94**:363, 1931; **100**:319, 1934.
10. Crisp, N. W. Proc. Staff Meet. Mayo Clin. **5**:128, 1930.
11. Dean, H. R. J. Path. & Bact. **25**:305, 1922.
12. DeCourcy, J. L. Ann. Surg. **106**:58, 1937.
13. Denecke, G. Ztschr. f. Immunitatsforsch. u. exper. Therap. **22**:501, 1914.
14. Duval, cited in The French Surgical Congress, Foreign Letters (Paris). J. A. M. A. **109**:1735, 1937.
15. Elanskij, cited by König.
16. Elman, R. Gynec. & Obst. **56**:175, 1933; Am. J. Surg. **26**:438, 1934.
17. Eversole, W. J., *et al.* The Nervous Factor in Shock Induced by Muscle Trauma in Normal Dogs. Am. J. Physiol. **140**:490, 1944.
18. Fitz, R. A Panoramic View of Thyrotoxicosis. J. A. M. A. **125**:943, 1944.
19. Freedlander, S. O. and Lenhart, C. H. Traumatic Shock. Arch. Surg. **25**:693, 1932.
20. Gurd, F. B. and Emrys-Roberts, E. Lancet **1**:763, 1920.
21. Hartley, G., Jr. and Lushbaugh, C. C. Experimental allergic focal necrosis of the liver. Am. J. Path. **18**:323, 1942.
22. Helwig, F. C. and Orr, T. G. Traumatic Necrosis of the Liver with Extensive Retention of Creatinine and High Grade Nephrosis. Arch. Surg. **24**:136, 1932.
23. Hertzler, A. E. Pathogenesis of Goiter Considered as One Continuous Disease Process. Arch. Surg. **16**:61, 1928.
24. Hesse, E. Beitr. z. klin. Chir. **163**:390, 1936.
25. Heussar, H. and Schar, W. Zentralbl. f. Chir. **57**: 1522, 1930.
26. Iljin, in discussion on Malijšev. Arch. f. klin. Chir. **184**:536, 1936.
27. Leblond, C. P. Thoai, Nguyen-van and Segal, G. Compt. rend. Soc. de. biol. **130**:1557, 1939.
28. MacGregor, cited by Wilson.
29. Malijšev, B. Verhandl. d. 1st Konf. f. Bluttransfusion, Leningrad, 1933: abstracted, Internat. Abstr. Surg. **60**:55, 1935.
30. Manwaring, W. H. Ztschr. f. Immunitatsforsch. u. exper. Therap. **8**:1, 1910. (Abstr. Johns Hopkins Hosp. Bul. **21**:275, 1910.)
31. Mason, E. C. and Nau, C. A. Surg. Gynec. & Obst. **60**:769, 1935.
32. Murphy, J. B. Deutsche Ztschr. f. Chir. **45**:506, 1897.
33. Pannella, P. Ann. ital. di chir. **14**:1, 1935.
34. Peters, J. P. Yale J. Biol. & Med. **9**:311, 1937.
35. Petroff, in discussion on Malijšev: Ibid.
36. Prausnitz, C. and Kustner, R. Studien über die Überempfindlichkeit. Centralbl. f. Bakteriol. **86**:160, 1921.
37. Rosenow, E. C. The Newer Bacteriology of Various Infections as Determined by Special Methods. J. A. M. A. **63**:903, 1919.
38. Schede, M. Verhandl. d. deutsch. Gesellsch. f. Chir. **16**:151, 1887.
39. Selye, Hans. The Alarm Reaction. The Cyclopedia of Medical Surgery and Specialties, F. A. Davis Co., 1940.
40. Simonds, J. P. Am. J. Physiol. **65**:512, 1923.
41. Simonds, J. P. Am. J. Physiol. **72**:1, 1925.
42. Skundina, in discussion on Malijšev.
43. Slome, D. and O'Shaughnessy, L. The Nervous Factor in Traumatic Shock. Brit. J. Surg. **25**:900, 1938.
44. Sunder-Plassmann, P. Exophthalmic Goitre and Its Treatment. Deutsche bed. Wchnschr. **67**:141, 1941.
45. Swingle, W. W. *et al.* Experimental Analysis of the Nervous Factor in Shock Induced by Muscle Trauma in Normal Dogs. Am. J. Physiol. **141**:54, 1944.
46. Thomas, H. B. and Leiphart, C. D. Septicemia and Purpura with Adrenal Hemorrhage in the Adult (Waterhouse-Friederichsen Syndrome). J. A. M. A. **125**:884, 1944.
47. Voegtlin, C. and Bernheim, B. M. Jour. Pharmacol. & Exper. Therap. **2**:507, 1911.
48. Wangensteen, O. H. and Waldron, G. W. Studies in Intestinal Obstruction: Strangulation Obstruction; Comparison of the Toxicity of the Intestine and Other Tissues Autolyzed in Vivo and in Vitro. Arch. Surg. **17**:430, 1928.
49. Weil, R. Jour. Immunol. **2**:469, 1917 and **2**:535, 1917.
50. Weiskotten, cited by Wilson.
51. Widal, F. and Abrami, P. Asthme et hyperthyroidisme. Presse med. **32**:473, 1924.
52. Wilensky, A. O. The Allergic Pathogenetic Mechanism in Thyrotoxicosis. Surgery, April, 1945.
53. Wilensky, A. O. Occurrence, Distribution and Pathogenesis of So-called Liver Death and/or The Hepatorenal Syndrome. Arch. Surg. **38**:625, 1939.

Symposium on Use of Penicillin

Presented at Guild Meeting, Milwaukee, Wisconsin, March 28, 1945

PENICILLIN IN UROLOGY

WALTER M. KEARNS, M.D., F.A.C.S., F.I.C.S.
MILWAUKEE, WISCONSIN

PATIENTS with infections of the urinary tract are especially blessed by the discovery of the "sulfa" drugs and penicillin. Both agents exert a two-fold effect in this area; first, by action through the circulation on the tissue of the tract, and second, on the urinary mucosa by their presence in the excreted urine. In previous years, our efforts at sterilization of the urinary tract, when compared with modern methods, were indeed feeble. The agents formerly administered—with the exception of neoarsphenamine—administered intravenously, worked solely through surface action, which in turn was limited by dilution and hydrogen ion concentration. Urotropin, caprokol and mandelic acid were useful, but for maximal benefits required strict limitation of fluids and acidulation of the urine which was difficult, if not impossible to attain in some patients. Nevertheless, these latter three drugs have a definite place in the treatment of urinary infections and must not be entirely relegated.

In treating infections of the urinary tract, one cannot logically divorce "sulfa" drugs from penicillin, because the one augments the other, due to the fact that most such infections are of a mixed character. Oftentimes the sulfa preparation is effective where the penicillin is not and vice versa. Even where the offending organism is susceptible to both, the combined treatment results in greater potency, and the "sulfa" may be continued alone where a prolongation of antibiotic action is desirable to prevent recrudescence of the infection.

In determining the choice of drug and its probable efficacy, the gram stain is most important. It has a much wider range of applicability than cultures because of its simplicity, reliability and time-saving. A gram stain carried out promptly after the aseptic collection of urine gives one a more accurate appraisal of the number of organisms and the proportion of different types than does the culture. After 24 to 48 hours the latter may very well record a disproportionate growth of organisms which actually represent contamination or play a very minor part in the infectious process. The cultures and subcultures, of course, do differentiate more precisely the particular classification of organism. This refinement is necessary in some instances in order to master the various infections by applying the most specific agent. However, for routine use, the gram stain is a more useful guide, because the effectiveness of both the sulfonamides and penicillin have now been quite exhaustively worked out on the basis of their action on gram positive and gram negative organisms.

Fortunately, there are very few of the common infections of the urinary tract which are not susceptible either to penicillin or to the sulfanilamides. Notable among those resistant to these drugs are streptococcus fecalis, certain strains of bacillus coli, aerobacter aerogenes and proteus ammoniae. For comparison in susceptibility, staphylococcus aureus is inhibited with a concentration

of 1/30 of a unit of penicillin per cubic centimeter of urine, the staphylococcus fecalis requires 3 units, the proteus ammoniae 8 units, and some of the strains of B. Coli are not affected until a level of 30 units or more per cc. is reached. This concentration would practically rule out penicillin as a means of treating these infections. The normal kidney is able to excrete about 60 per cent of injected penicillin. If 100,000 units are injected in a day and 2,000 cc. of urine excreted, the urinary concentration of penicillin would average 30 units per cc., but there would be periods when it would exceed this level, while at other times the level would fall well below. The relatively brief period of administration of penicillin covering a period of from one to three or four days places a limitation on its usefulness. Attempts to overcome the necessity for the frequent, " 'round the clock," intramuscular injections of penicillin are being carried out with the injection of penicillin in oil, in a combination of oil and wax, and by oral administration with a slowly dissolving coating to retard absorption. I myself am experimenting with pellet implantation of penicillin, which gives promise of overcoming the need for frequent injections.

Now that ample supplies of penicillin have been liberated, its true place in the treatment of these infections will soon be established. No doubt many new applications will be found in the treatment of postoperative sepsis in which the bacteriology is difficult to demonstrate; also in many of the commoner types of infection occurring with obstructive lesions.

PENICILLIN IN ORTHOPEDIC SURGERY

L. D. SMITH, M.D., F.A.C.S., F.I.C.S.
MILWAUKEE, WISCONSIN

Any study of the application of chematherapy to bone infection should be made in the knowledge of the kind of bone infection involved, bacterially and histologically. The bacillus of tuberculosis, the pyogenic organisms, the fungi, parasites and the spiracheta pallida are all at one time or another the exciting agent in this phenomenon. Histologically I recognize four general forms or patterns of bone infection.

To clarify our concept of the bone tissue phenomena and to rationalize any type of treatment of osteomyelitis I shall designate by a brief outline four forms. The term osteomyelitis is generally used to include all infections of bone. I believe this blanket term lacks specificity of definition and is inaccurate when applied to some common bone infections. The outline given, differentiates the various types:

1. Acute diffuse hematogenous osteomyelitis of immature bone, i.e., a bone with an actively developing epiphysis;
2. Focal punctate necrosis of bone due to a punctured wound;
3. Septic necrosis of bone occurring in infected compound fractures by contiguity to the process in adjacent soft tissues or by proximity to neighboring suppuration in soft tissue;
4. Chronic generalized suppurative osteomyelitis; the sequel to form 1 when inadequately treated.

Form 1 occurs frequently fatally in children, not because of the toxicity of the pathogen but of the rigidity of the tissue environment and its peculiar reaction. In the substance or neighbor-

hood of the growing epiphysis, the blood borne agent finds lodgement in a highly vascularized region of almost static fluid movement, in a locality of rapidly dividing, immature, low resistance bone cells, surrounded by an inelastic, rigid stroma and bathed by serum and debris of traumatized vessels and cellular tissue. The reaction can be, and sometimes is, explosive. The internal pressure set up is intense and destructive; it feeds upon the products of its own destruction and from within outwards. The adjacent congestion and stasis is in proportion. Fluid exchange is seriously embarrassed or may be practically nonextant. The pain may be shocking unto death; or the host may tolerate progress until, through pressure atrophy, the tumor bursts the cortex. The change then is immediate and dramatic but benign. The pain ceases, shock disappears and the patient falls into an exhausted restful sleep. Another calamity is now initiated. (Form 4.)

Form 2. By the nature of its cause, there is provided a canal or channel of egress. The phenomenon of form 1 does not and can not ensue. However, a favorable environment for clostridia is provided. Usually the focus is early walled off and drainage occurs through the puncture wound itself.

Form 3. Here we have the phenomenon of a substance partaking of the conflagration by contiguity though not of itself particularly combustible. This form does not and cannot simulate the histopathology of form 1.

Form 4. If the expanding tumor of form 1 bursts beneath the periosteum, the first stage of chronic suppurative generalized osteomyelitis ensues. The virulent escaping pus dissects distally between the enclosing and expanding periosteum to penetrate anew through the numerous Haversian canals into the cortex and substance of the bone, until eventually the whole shaft is honeycombed. This stage burns itself out presently and with little systemic cognition. There is great bacterial activity and tissue necrosis, but there is no pressure.

In the light of the above exhibits, methods of counter attack may be compared:

Form 1. The great pain and shock are due to pressure phenomena and not to the virulence, toxicity or large number of pathogens. Their number is infinitely larger in the first stage of form 4, in which there is immediate and continued relief with cessation of pain and shock. Because of the relative localization of the focus and the surrounding congestion, chematherapy is limited and retarded in its action. The simpler and more positive procedure would seem to be the relief of pressure if (and it is so) a small drill hole into the region will provide such relief. Any more elaborate or mutilating operation is not only not necessary but is contraindicated.

Form 2. Debridement with wide opening of the puncture is physically indicated and adequate.

Form 3. Adequate debridement and sufficient treatment of the fracture has been invariably satisfactory in my series; by sufficient treatment of the fracture, I mean perfect and continued immobilization.

Form 4. This is the sequel of form 1 unsuccessfully treated. After the first stage of the chronic form, we have burned out debris of a generalized destruction, lurking, attenuated, dormant bacteria, sequestrae and chronic, subacute, draining sinuses. It is the sequestrae now, not the attenuated (or frequently absent) bacteria, acting as foreign bodies, that continue the sinuses. They may become residual, adventitious channels with permanent specialized

linings. The problem here is evidently mechanical and physical, not bacterial.

What, then, is the case for penicillin in bone infection? There is accurate information of the efficacy of this extraordinary agent against various organisms. Against some where it can reach them, it is marvelously lethal; against some, under even the most favorable auspices, it is important. In those cases of bone infection in which the offending pathogen is susceptible to penicillin, it should be used to supplement known tried and logical mechanical (i.e., surgical) procedures but never as a substitute for them.

PENICILLIN IN OPHTHALMOLOGY

SAMUEL G. HIGGINS, M.D., F.I.C.S.
MILWAUKEE, WISCONSIN

Abstracts from the literaure are important and informative, but reports from personal observations may be more interesting. Here is a case in point:

A girl of 8 years had unilateral keratitis, vascularization and hazy cornea. Lacrimation and blepharitis were severe and the pupil would not dilate with atropine. Teeth and general examination did not reveal evidence of inherited syphilis. Records, however, showed that the mother had been treated for lues some years before. The child was sent to the hospital and after 100,000 units of penicillin were injected, the pupil could be dilated with atropine. She received injections of 10,000 to 15,000 units every 3 hours until a course of 1,000,000 units had been used. Lacrimation and blepharitis ceased on the second day of penicillin treatment. The eye was entirely cleared, with devascularization and only one hazy spot remaining in the cornea.

Although the eye had cleared, the injections were repeated again after a period of 4 weeks.

Another case illustrates a different method:

A nurse at the hospital was unable to continue on duty, due to severe conjunctivitis. There was profuse discharge and the lids stuck together. The residents had used argyrol and zephiran. Sulfathiazole ointment was tried and discontinued, as it was irritating. The smear showed diplococci.

Penicillin was dropped in the eye every hour, while she was awake. The solution was 250 units per cc. in saline. Treatment was begun in the afternoon and marked improvement was noticed the next morning. Treatments continued the next day, the drops being used every two hours. Treatment was continued in this way for two days longer after which the eyes cleared and no further treatment was necessary.

Dunnington-von Sallmann [1] report on iontophoreses (i.e., cataphoresis as the introduction of ions by the electric current). This technic is not described. Also they report "Corneal ulcers were successfully treated with penicillin sodium in 0.5 per cent concentration, in an ointment base composed of anhydrous wool fat, with 10 per cent liquid petroleum, applied at 3 hour intervals. There was immediate relief of the symptoms. The ulcer healed in 5 days."

"Staphylococcic infections of the vitreous were arrested with a single injection of penicillin when administered within 12 hours after inoculation. Treatment failed when a period of 24 hours was allowed to elapse between inoculation and the therapy."

Le Moine and Le Moine [2] report a case of purulent conjunctivitis with a positive culture for hemolytic staphylococcus. The infant, age 25 days and

six weeks premature, was treated for 15 days by irrigation with boric solution followed by 5 per cent sodium sulfathiazole solution. Sulfathiazole was given orally, 2 grains every six hours. This regime was followed for three days with no improvement. Penicillin treatment effected a cure within five days. The solution was sodium penicillin in normal saline, containing 700 Florey or Oxford units, 2 drops every hour after boric irrigation.

As all forms of gonococcic infection succumb to penicillin, as does gonorrheal ophthalmia.

My personal experience with penicillin in otolaryngology is limited to consultation and discussion of its use by other colleagues. They report a case in which a child survived meningitis of otic origin through the use of penicillin therapy and a mastoidectomy. I would consider penicillin a useful adjunct in meningitis and brain abscess to be used following surgical drainage, when that is indicated. In cases where the involved area is inaccessible, such as cavernous sinus thrombosis,[3] reports in the literature are encouraging.[4-6]

I have seen many patients who have been told they had a "strep. throat". I have noted more rapid healing under sulfa therapy than from our former methods. Sulfathiazole was the drug I used. Now that penicillin is readily available, I may try it as a frequent spray.

Crowe and Ward[7] refer to an allied agent, tyrothricin. As this comes to us in an alcoholic solution, its application is limited. However, it has become the therapy of choice with me in numerous cases of furunculosis of the external auditory canal, and the frequently accompanying eczematous condition of the auricle. After dry cleaning of the canal and auricle (especially if an ointment has previously been applied) I saturate a fourth-inch gauze with penicillin and instruct the patient to allow this to remain until I change it the following day. The effect is not so good when the patient removes the gauze or skips a day. I am under the impression that healing would be hastened if the applications were made twice in twenty-four hours. As fresh gauze is more effective, I have not suggested home treatments.

While I am wary of operating on the upper sinuses in the presence of an acute infection, I favor puncture and lavage of the maxillary sinuses. Drainage of the antrum is followed by prompt relief and cure, even if the source was primarily from the ethmoids. Our usual conservative methods of nasal drainage are successful and less disturbing than intramuscular injections of penicillin.

PENICILLIN IN DISEASES OF MOUTH, JAWS AND FACE

MATTHEW N. FEDERSPIEL, D.D.S., M.D., F.A.C.S.
MILWAUKEE, WISCONSIN

In diseases of the mouth, jaws and face, penicillin plays a very important part in control of infections. However in perimaxillary phlegmons and Ludwig's angina drainage must, of course, be considered.

In my practice, I find it advantageous to control infection by using sufficient dosages of penicillin and applying hot compresses to localize the diseased area. In many of these cases, the temperature drops to normal after the use of peni-

cillin. The localized swelling is then drained and the wound washed with sulfathiazole and tube drainage inserted. Under this form of treatment patients make remarkable progress.

In the treatment of compound fractures where it is necessary to do an open reduction, the bones are placed in their normal position and, before closing the wound, sulfathiazole in suspension, is applied. The patient is then given penicillin postoperatively in doses up to 100,000 units per day for two or three days. Practically all cases under this form of treatment go on to normal healing.

Since the results have been so promising, I now make it a routine practice to use penicillin postoperatively in all cases where it is necessary to operate and one has to deal with infections. In cases where there is reconstructive work, such as on the nose, lip, palate, etc., I also recommend penicillin postoperatively.

The reaction is practically nil. However I had one patient who had been suffering from an osteomyelitis of the mandible in whom it was necessary to do a sequestrectomy and immobilize the jaw. This man was given penicillin in doses of 5,000 units every four hours for three days. His temperature dropped to normal but he deevloped urticaria. This cleared up after the penicillin was discontinued.

PENICILLIN IN ABDOMINAL SURGERY

VICTOR F. MARSHALL, M.D., F.A.C.S., F.I.C.S.
APPLETON, WISCONSIN

Abdominal cases treated with this agent have been few in number as evidenced by the meager number reported in the literature.

An article in the *Journal of the American Medical Association* for December, 1943, upon "Penicillin Therapy of Surgical Infections in the U. S. Army" reported several cases, among these a case of appendicitis, one of subphrenic abscess and one of peritonitis (of unknown cause).

In the conclusion of this article the statement was made that the agent could be administered in various ways. I have found penicillin to be an effective antibacterial agent in the treatment of acute infections caused by staphylococci, hemolytic and non-hemolytic streptococci, mixed infections due to gram positive bacteria and actinomycosis. The gram negative diplococci are susceptible to treatment but gram negative bacilli are resistant. Mixed infections with both gram positive and gram negative organisms may be benefited through the effect upon the susceptible species.

Lockwood presented an article in the *Annals of Surgery* for September, 1944, "The Use of Penicillin in Surgical Infections," in which he stated that in peritonitis, it was only possible to study a few cases. "Less certain would be the results in infections developing after appendicitis including pylephlebitis and perihepatic infections."

A case of acute appendicitis was reported in the *British Medical Journal* for November 4, 1944, which affected a male aged 4 years and 11 months. The temperature was 101.8° F., pulse, 136. This case was operated upon in the afternoon. The appendix was perforated in its middle portion. The organisms were hemolyticus, staphylococci and gram negative diplococcus. Peni-

cillin was applied directly through the drainage tube for a period of forty-eight hours. Fourteen injections were made, 200,000 units administered. Recovery ensued.

Finally an article by Lt. Commander G. B. Fouley, M.C.V. (S), USNR, in the *Journal of the American Medical Association* for December 30, 1944, upon "The Use of Penicillin in the Treatment of Peritonitis" in an experiment upon a dog stated "should prove to be of some benefit to man."

Your attention is invited to the several brochures upon penicillin recently issued by E. R. Squibb and Sons, New York. The brochures present the uses and limitations of this agent.

My own personal experience is limited to but two cases, one of which was an empyema of the gall bladder, subjected to a cholecystectomy and the use of penicillin, with recovery. The second case, I report in more detail.

The patient was a school girl, aged 14 years, who was seized with an attack of acute appendicitis in the early morning hours. The patient was seen in consultation with my associate in our office about 2 o'clock in the afternoon. An appendectomy was performed through a gridiron incision. The appendix was acutely inflammed, elongated and covered with lymph. No difficulty was encountered in the operation. The patient was returned to bed in good condition. I did not see her the following morning. However, my associate informed me her condition was excellent.

The following day she was not seen by either of us. The hospital authorities would have advised me of any abnormality in the patient's condition. At noon, almost forty-eight hours after the operation, she was inadvertently given a large meal with no untoward effect. Also the afternoon of that day she had many visitors. In the evening a generous meal was again given with no apparent ill results.

About 10 o'clock the following morning, the patient was seized with pain in the upper abdomen accompanied by frequent intestinal evacuations. There was no nausea or vomiting. Her temperature rose to 103° F. The patient was examined by me the following morning. The temperature had dropped to 100°; the abdomen was not distended and not unduly tender. Penicillin, 100,000 units daily was administered intravenously with glucose solution.

The next day a whole blood transfusion (500 cc.) was given, which was repeated on the following day.

Two days later a tumefaction of the lower portion of the abdomen appeared. The abdomen was reopened in the original wound and drained of 250 cc. of dark fluid with a fecal odor. A drainage tube was inserted. The patient seemed materially to improve for three days after which pronounced elevation of temperature, tympany and lethargy occurred, with death following some twenty-four hours later. Autopsy revealed the appendiceal stump open, through which leakage of intestinal contents had occurred (ligation of stump with two tier inverting sutures had been employed) with several small "lakes" of septic fluid and perifonitis present.

Intestinal contents are complex and many gram negative organisms may be present. It is my opinion, therefore, that penicillin is just another valuable agent at the disposal of the physician or surgeon to use in septic conditions involving the abdominal cavity and viscera.

DISCUSSION

Karl Schlaepfer, F.I.C.S., Milwaukee: I agree with Dr. Marshall that penicillin is inferior to sulfathiazole and particularly succinylsulfathiazole in intra-abdominal surgery involving the intestines, where contamination through the intestines may result. The bacterium-coli group, the main cause for such infection, arising after this type of surgery, is not amenable to efficient bacteriostatic or bacteriocidal action by penicillin. A thin layer of sulfathiazole

powder uniformly spread over the suture lines in gastric and small intestinal surgery as well as following appendectomy, has proved very successful. However, caking of the powder, due to uneven application, may cause extensive scar formation, from injury to the serosa, with resulting kinking of a loop of intestine and possible ileus. In large bowel surgery, thorough pre- and postoperative oral administration of succinylsulfathiazole has also been very effective.

Due to the prominent space given penicillin in the lay press with many unwarranted claims, the danger is great that we may see a similar boom in the use of penicillin as experienced in the vitamin field. This would prove advantageous to the manufacturers at the expense of the patients and detrimental to the reputation of our profession.

SUMMARY

The remarks of five speakers, only a portion of those who participated in this symposium, are included in this report. The use of penicillin in urology, orthopedic surgery, ophthalmology, abdominal surgery and in diseases of the mouth, jaws and face, is discussed by specialists in these branches. Although each speaker's time was limited to 10 minutes, each gave a clear indication of his experiences and opinion.

The concensus appears to be that, while valuable, the virtues of this new preparation have been decidedly overblown by the popular press. One specialist likens public reaction to this, to the earlier furore over vitamins.

SOMMAIRE

Cinq orateurs prirent la parole. Dans ce rapport ne sont inclus que quelques observations. L'emploi de la penicillin en urologie, en chirurgie orthopédique, en ophthalmologie, en chirurgie abdominale et dans les maladies de la bouche, des machoires et de la figure fut discuté par des spécialistes, de ces différentes branches de la médecine. Chaque rapporteur fut limité à dix minutes et chacun donna une indication très lucide de ces recherches et une expression précise de ses vues.

La penicillin quoique possédant une grand valeur néanmoins n'est pas une panacée. On peut dire autant des vitamines.

RESUMEN

Aquí se resumen las afirmaciones de cinco de los expertos que tomaron parte en una discusión sobre la penicilina. El empleo de esta substancia en urología, ortopédica, oftalmología, cirugía abdominal y en las enfermedades de la boca, mandíbula y cara, fué analizado por especialistas en estas diversas ramas. Aun cuando el tiempo otorgado a cada orador fué limitado a sólo 10 minutos, todos ellos hicieron una exposición clara de sus experiencias y opiniones.

En general todos parecen estar de acuerdo en que aun siendo esta substancia un medicamento muy valioso, su utilidad ha sido grandemente exagerada por la prensa popular. Uno de los autores compara esto a lo ocurrido con el furor que siguió a la iniciación de la terapéutica con vitaminas.

Заседание о пенициллине.

Свод.

Здесь включены заметки только пяти из многих докладчиков принявших участие в обмене мнений. Обсуждено разными специалистами применение пенициллина в урологии, ортопедической хи-

ургии, офталмологии, хирургии живота и болезнях рта, челюстей и лица. Хотя каждый докладчик был ограничен десятью минутами, каждый указал свой опыт и мнение.

Было создано общее впечатление, что хотя этот препарат является очень ценным, его значительность невероятно преувеличена популярной прессой. Один специалист приподобил реакцию публики к фурору, причиненному витаминами.

BIBLIOGRAPHY

1. Dunning-von Sallman: Arch. Ophth. **32**:353 (Nov.) 1944.
2. Le Moine and Le Moine: Penicillin in treatment of purulwent conjunctivitis. Am. Jour. Ophth. **27**:1428 (Dec.) 1944.
3. Weisenfeld and Phillips: Thrombophlebitis of a cavernous sinus following extraction of teeth; cure with Penicillin and Heparin. Arch. Otolaryng. **40**:497 (Dec.) 1944.
4. Johnstone: Cavernous sinus thrombosis treated with Penicillin. Lancet **1**:9 (Jan. 6) 1945.
5. Woern: Penicillin in ear, nose and throat. Arizona Med. **2**:333 (Jan.) 1945.
6. Wolfe and Gain: Thrombosis of cavernous sinuses. Arch. Otolaryng. **41**:79 (Jan.) 1945.
7. Crowe and Ward: Chemotherapy, microbiotic substances and radon—their local use as therapeutic agents in otolaryngology. New York State J. Med. **45**:61 (Jan. 1) 1945.

(Continued from page 303)

In many of these patients under our observation, studies of the hemotacrit readings, albumin-globulin ratios, blood counts, blood pressures and many other details were noted, not all particularly relevant to this discussion. It is our purpose to emphasize several well known facts, namely that many patients are subjected to operation while deficient in protein and lose protein throughout their convalescence. In the poor risk patient, this becomes a matter of major importance, and hypoproteinemia should be considered a possible complication; nitrogen balance should be maintained by alimentation through natural channels or parenterally with adequate proteids, and glucose.

SUMMARY

From our experience and that of other observers it is apparent that a considerable number of patients enter hospitals and submit to operations with a plasma protein level below normal and during the week following operation, they are in negative nitrogen balance, which is equivalent to stating that the patient is using up his body proteids. If a balance can be maintained, the patient's ability to recover is definitely enhanced, and the period of convalescence is shortened. Nitrogen balance cannot be maintained by the administration of glucose and saline solutions alone. If the patient can ingest and assimilate sufficient food, this takes care of the problem; if, on the other hand, feeding is inadvisable or impossible, recourse must be had to parenteral feeding.

From recent clinical research in this field we can state that we can maintain nitrogen balance, not with amino acid solutions alone, but by a combination of protein solutions and glucose in saline. We know that 60 to 100 gms. of protein and 100 to 200 gms. of glucose intravenously, will maintain most postoperative patients in positive balance, unless liver damage is present. The addition of selected vitamins is also recommended.

(French and Spanish summaries of this material will appear in the next issue.)

Свод

Аминовые кислоты.

Обсуждена важность для преоперативного больного аминовых кислот. Подробно разобраны причины дефицита в азотном равновесии тела во время и немедленно после операции. Дан способ приготовления подходящей для внутривенозного вливания формы матерьяла. Разобраны реакции в серии трехсот оперативных случаев.

Rehabilitation in the Navy*

CAPT. HOWARD H. MONTGOMERY (MC), USN

As one reviews the history of the care of casualties during previous wars, it is found that our government has called upon the medical profession to provide the best care and attention for the sick and wounded that its knowledge and skill afforded at the time. The profession has wholeheartedly assumed the responsibility placed upon it and, in meeting this responsibility, discoveries and advances have been made which have had profound effects upon medical practice for years afterward. The efforts of the medical men in the fighting forces have had the humane objective of alleviating pain and suffering, and restoring the disabled as nearly as might be to normal. They have also had the practical objectives of returning men to the fighting ranks as rapidly as possible, in order to retain the services of trained men—and to minimize, as far as possible, the extent of the disability in those who could no longer serve. On the whole, medical care provided for men in the Armed Forces has been of high quality and adequate.

Unfortunately, however, the records do not show the same success in providing assistance toward a satisfactory adjustment to civil life for those who were discharged for physical disability. Apparently little, if any, organized effort was made while they were in the service, to impress upon them that, although handicapped they were not disabled, or to guide them toward profitable employment compatible with their handicaps. Social and economic rehabilitation were treated largely as matters to be worked out by the men themselves after they returned to their home communities. This probably added materially to the problems of readjustment of the country to peacetime conditions and certainly made the lot of the individual veteran most difficult.

In the light of the past, our course under present conditions seemed clear. We must make very sure that the men of the Navy and Marine Corps receive the best medical and surgical care and attention that present day knowledge and skill afford. We must see to it that every man possible is restored to health and returned to duty as rapidly as may be, within the precepts of good medical practice. We must do all we can while the disabled are under treatment to assist them toward a proper adjustment to civil life. The rehabilitation effort of the Navy is based on these principles.

We do not consider rehabilitation a separate undertaking started at some ill-defined stage in recovery, nor a procedure applicable only to a particular type of case. Instead, it is a process that starts as soon as a man comes to medical attention, and that includes all patients. It must terminate in the Navy when the man has attained maximum benefit from treatment and is ready to leave the hospital. It consists of the usual and expected medical and surgical care, supplemented by services which will hasten recovery and return to duty in an optimum state of physical fitness and with a minimum loss of adeptness for usual duties, or prepare the way for a satisfactory readjustment to civil life.

I feel sure that the work of our medical officers in all branches of medicine and surgery has already been brought

---

The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

* Read before Ninth Assembly, U. S. Chapter, International College of Surgeons, Philadelphia, Pa.

to your attention. It is not my purpose to discuss this fundamental part of rehabilitation, but, instead, to bring to your attention that part which supplements their work in our hospitals.

The hospitals of the Navy are all general hospitals in the sense that they are not confined to the treatment of any particular type of case. Their patients comprise personnel of the Navy, Marine Corps and Coast Guard who are admitted from stations and activities nearby, as well as casualties returned from the combat areas. As a general rule, the patients received from nearby stations are admitted for acute conditions from which recovery within a short period is the usual outcome. The patients received from combat areas, however, and a certain percentage received by local admissions, require prolonged periods of treatment before they are in condition to leave the hospital, whether to be returned to duty or to be discharged from the service. Among these cases of long duration, there are conditions which present special problems of treatment or care, and certain of our hospitals have been selected to receive them. Cases of bilateral blindness require special personnel and training facilities to aid them in adjusting to their disability. The comparatively few such patients are cared for at the Naval Hospital in Philadelphia. Patients who have undergone loss of hearing within the conversational range are also concentrated in the same hospital, in order that we may give full attention to the psychological adjustment which is so necessary, to training in speech and lip reading, and may properly fit them with hearing aids. Patients who have suffered amputation of an extremity are treated in the Naval Hospitals at Mare Island, California, and Philadelphia, Pennsylvania. In both of these hospitals, surgery necessary for revision of the stump is performed and the patients are supplied with artificial limbs which are manufactured in the hospital. Patients with rheumatic fever or pulmonary tuberculosis, and subjects for plastic surgery, to mention a few other conditions, are concentrated in other hospitals, but in all instances the hospital also conducts its general work. Consequently, the rehabilitation effort in any one hospital, both in its treatment and in its supplementary activities, is designed to meet the needs of its particular patient population.

In accordance with a long-standing policy of the Medical Department, patients who can be restored to duty are retained in the hospital until convalescence is completed; patients who are too disabled for further service are retained until they have received maximum benefit from treatment. They, therefore, remain in our hospitals longer than they would in civilian institutions for the same conditions. As they recover and their need for medical or surgical care diminishes and they feel increasingly fit, time may hang heavily on their hands. A Rehabilitation Program has been developed to make profitable use of this time.

The Rehabilitation Program of the Navy is designed to give attention to the problems of recovery that go beyond treatment of the ailments that brought the patients into the hospitals, hasten their convalescence and prepare them for gainful activity after they leave. Many fields of endeavor are included in this Program—physical therapy, occupational therapy, physical training, educational and vocational counseling, social service in its broadest meaning, recreation, and, for those who return to civil life, assistance in their problems of readjustment. Since the Program supplements the usual treatment procedures, it is governed at all times by

the judgment of the medical officer responsible for the treatment of the individual patient as to when these auxiliary activities should be introduced and which ones will contribute most to the patient's recovery.

The activities of the Program are coördinated in each hospital by a medical officer who has been designated, the Rehabilitation Officer. He is assisted by a Board which coördinates all activities of the Program.

Although the same services are used for all patients, the direction they take and which ones are employed, depend upon the patient's probable length of hospital residence and whether he will probably return to duty or will be discharged to civil life.

Patients who will be returned to duty receive treatment by physical therapy and occupational therapy, if, in the judgment of the medical officer, either of these will contribute to more rapid recovery. It is necessary that these men be in full physical vigor when they return to their usual duty assignments. Therefore, they are required to take part in medically supervised physical training. This is conducted by naval personnel experienced in physical education and has as its objective, minimizing the deterioration in general physical condition which results from both the direct effects of the illness or injury, and the inactivity of hospital life. In order that they will not lose adeptness for their regular duties, an educational and training program is conducted by naval personnel who are experienced educators and who have received special instruction to prepare them for hospital duty. They have available a very wide range of both self-help and correspondence courses and they conduct classroom instruction when a sufficient number of men are interested in appropriate subjects. Men who will be in the hospital long enough to justify undertaking a course of study are encouraged to pursue some subject that will be helpful to them after their recovery. It is also possible for patients to complete the courses of instruction which are prerequisite for promotion of enlisted men, and to be given full credit for them. Many kinds of practical training in Navy duties are carried on, often even by bed patients. Such things as reading flag signals, recognition of war craft, and radio sending and receiving are carried on in the wards. Use is also made of the facilities available in the shops and similar activities of the hospital for men with mechanical ratings. Men who will be in the hospital for a considerable period, may undertake courses of study for which they can receive academic credit in the schools they left to enter the service. In short, it is the purpose of the program to make use of the time they must spend in the hospital to prepare them both physically and mentally for return to duty.

Patients who will be discharged from the service for physical disability have the benefit of the same services. It is just as essential that they be in good general physical condition and that their time in the hospital be profitably occupied. As soon as it is determined that a patient must be discharged for physical disability, he is interviewed by a trained vocational counsellor who reviews with him his training and experience both before and during his service. The man's aims for his future are learned. Professional members of the hospital staff interpret his physical and psychological handicaps in terms of their effect on his future activities. Based on this general survey, the man is then assisted in formulating a plan for his course of action after he leaves the service. During the remainder of his hospital residence, he is encouraged

to pursue academic or practical training that will best prepare him immediately to set out on his selected course. All of our counseling and educational work with these men is designed to return them to civil life in a condition that will enable them to secure gainful employment. We consider it a duty to see to it that they are not led to believe that they must live on the pension they will receive, but that instead they must take a useful place in their local communities and progress by their own efforts. During the final days of hospitalization, these men are assisted in obtaining employment by referral to representatives of Federal and State agencies providing employment services, should they so desire. Applications for pensions or other benefits under existing laws are prepared and, before they are discharged, they are fully and accurately informed of the rights and benefits available to them as veterans.

Throughout the hospitalization of all patients, close attention is given to individual morale. This intangible but often determining factor in the recovery of any patient is of major significance among ours. Concern over conditions at home, worry as to the future effect of disabilities, the urge to get back into the fight, the desire to become economically independent if future military service is impossible—all have a bearing on how successful rehabilitation will be. Attention to morale starts with the initial interviews by the medical officer and is continued by the chaplains and by the trained social service workers of the American Red Cross to assist the men in solving their personal problems.

Although we aim to keep the patient's time fully occupied in profitable undertakings, we have not lost sight of the essential part wholesome recreation plays in any well ordered life. An extensive program of recreation which is coördinated with other features of the general rehabilitation scheme, is available both to patients confined to their wards and to those who are up and around.

Our rehabilitation effort then, resolves itself into a program to make the most profitable use possible of the time our patients must necessarily spend in the hospital. The majority of these patients are returned to active service, cured of the ailments which caused their admission, in full physical vigor, and with a minimum loss of adeptness for their usual duties. The lesser number who are returned to civil life, have been assisted in developing a plan for their post-service lives and have been given all practical aid toward placing this plan in effect with a minimum loss of time after discharge. We realize, however that, although we in the Navy can complete the physical rehabilitation of these patients, we can only lay the groundwork for their social and economic rehabilitation. Government has made many liberal provisions to assist these men to complete this phase of rehabilitation after their discharge from the service. It is our intention that the preliminary work we do before they are discharged will flow naturally into those provisions, so that progress toward complete rehabilitation will be one continuous, uninterrupted process.

SUMMARY

Following a brief review of the work of rehabilitation of disabled fighting men in earlier wars, the author outlines, in considerable detail, the work being done by the U. S. Navy during World War II, along the same lines. He lays especial emphasis upon the objects of such rehabilitation, namely, to return the man to duty in full physical and mental health, or, if he is so disabled

(Continued on page 347)

Some Obstetrical and Gynecological Problems

GILBERT FRANKLIN DOUGLAS, M.D., F.A.C.S., F.I.C.S.
BIRMINGHAM, ALABAMA

ABORTION

TO the physician who is doing general practice, obstetrics or gynecology, abortions will give considerable concern, for the reason that these must be dealt with almost daily. There are so many causes for abortion that it is rather difficult to list them all, but we have two predisposing factors: (1) death of an ovum in which there are hereditary faults, such as lethal or sublethal factors in the germ plasm and (2) low vitality, due to near-infertility, of the parents. There are also environmental faults such as malnutrition from defective implantation and acute or chronic disease in the mother. Another factor may be the separation of the ovum, possibly due to insufficient endocrine stimulus or low endometrial responses (abnormalities of the trophoblast) or there may be expulsive uterine contractions. Factors exciting such contractions may be mechanical hindrances to the growth of the fetus or external violence. Still another factor may be excessive uterine irritability.[1]

When we find cases with a history of abortion occurring after six weeks to three months of pregnancy, we must be concerned for these patients, as frequently they are most anxious to have children. However, considering the determining factors in such cases, we should not be so distressed when abortion has been completed, provided there are no infections or sequelae. We might compare these conditions to that of the faulty fruit which drops from the tree early in the growing season.

Here it might be of interest to glance at the accompanying table (see table on p. 333) which represents a 10-years' study (1933–42) of abortions in the Department of Obstetrics and Gynecology of the Hillman Hospital,[2] Birmingham, Alabama.

We note that the proportion of white to colored patients was about two to one in this study; the average age, 25.6 years. The average number of pregnancies was 2.9, while the number of abortions was 1.65; the number of viable children, 1.6. The number of infections was 24.7; those of the septic type being 7.8. Salpingitis accounts for 1.1 per cent and toxemia, .4 per cent. Operations in hospital included dilatation and curettage, 11 per cent, with sponge forceps, 7 per cent, with dilation of cervix, .5 per cent. Hemorrhages (slight or profuse) occurred in 7.9 per cent; 3.8 per cent showed a positive Wassermann. (The latter figure should be modified somewhat, as a number of these patients had antiluetic treatment in the clinic before the abortion occurred.)

The average number of transfusions was 3.41 per patient. (There were many more transfusions given during the latter years of the study than at the beginning.)

Treatment generally was conservative; percentages for these years were, 1941, 99 per cent, 1942, 99.5 per cent. Sulfonamides were used during the last seven years of the series with the following results: (a) cured, 44.7 per cent; (b) improved, 51.9 per cent; (c) died, 3.94 per cent, an average of 4 per year. The average number of days in hospital

TABLE I

	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	Average over 10 yr. period
Number of Cases											
1. Total	83	133	83	72	61	99	167	240	183	140	126.1
2. White	56	90	59	53	33	68	108	154	108	83	81.2
3. Colored	27	43	24	19	28	31	59	86	27	59	38.7
Age:											
4. Youngest	15	18	16	16	15	15	16	14	14	13	15.2
5. Oldest	40	45	45	42	48	46	44	45	42	44	44.1
6. Average	26.3	26	26	25.6	23.1	27.7	24	27.5	26.3	24.2	25.67
Marital State:											
7. Married	70	116	75	62	36	75	142	184	146	103	100.9
8. Widowed	1	0	1	1	2	5	3	7	6	7	3.3
9. Divorced	3	1	0	0	2	1	0	2	6	6	2.1
10. Single	9	16	7	9	21	18	32	26	24	24	18.6
Number of Pregnancies:											
11. Lowest	1	1	1	1	1	1	1	1	1	1	1
12. Highest	18	18	12	8	13	10	8	15	12	13	12.7
13. Average	3.7	3.3	2.4	2	2.6	3.1	3.1	3.2	3.45	3.13	2.998
Number of Abortions:											
14. Lowest	1	1	1	1	1	1	1	1	1	1	1
15. Highest	11	11	5	3	7	8	4	7	7	7	7
16. Average	1.6	1.4	1.1	1.2	1.6	1.6	2.4	2.5	1.57	1.55	1.652
Number of Children:											
17. Lowest	1	1	1	1	1	1	1	1	1	1	1
18. Highest	11	8	7	7	7	9	8	12	10	9	8.8
19. Average	2.3	1.96	1.4	1	1.5	1.3	1.7	1.6	2	1.48	1.624
Duration of Pregnancy in Months:											
20. Shortest	1.5	1.5	1	1	1	1	1	1	1	1	1.1
21. Longest	6	6	5	6	6	6	6	6	7	6	6
22. Average	2.5	2.9	2.82	2.72	2.1	2	1.9	3	3	2.5	2.544
Type of Abortion:											
23. Spontaneous	63	116	65	54	46	75	121	218	167	136	106.1
24. Induced	20	17	18	15	15	22	38	21	15	3	18.4
25. Therapeutic	0	0	0	3TB	0	2	8	1	1	1	1.6
26. *Number with Fever:*	73	107	71	58	25	52	80	118	32	140	75.6
27. *Average Number of Days Temperature:*	1.2	3.8	6.3	4.5	5.2	1.6	1.2	3	3.9	6.45	3.715
28. *Infections: Number*	10	47	23	22	13	27	30	41	26	8	24.7
Infections: Type											
29. Septic	2	1	1	3	1	1	6	32	26	5	7.8
30. Salpingitis	0	2	0	0	0	0	0	7	0	2	1.1
31. Toxemia	0	0	1	0	0	0	0	2	0	1	.4
Operation in Hospital:											
32. D & C	3	0	0	0	4	24	26	31	19	3	11.0
33. Sponge forceps	2	0	0	1	0	0	0	3	1	0	.7
34. Dilated cervix	1	0	0	1	0	0	0	3	0	0	.5
35. *Hemorrhage:*	4 (slight)	13	10	17	7	6	7	12	2	1	7.9
Wassermann:											
36. Plus two	1	4	2	0	0	0	0	10	7	6	3
37. Plus three	1	0	4	8	1	1	2	1	3	3	2.4
38. Plus four	0	7	4	3	8	4	7	6	11	11	6.1
39. Total plus	2	11	10	11	9	5	9	17	21	20	3.8*
40. *Transfusions:*	20	47	32	30	30	27	41	74	91	38	3.41†
41. *Treatment:*	Cons.	Cons.	Cons.	Cons.	Generally Cons.	More D&C Cons.	More D&C Cons.	Many D&C Gen. Cons.	99% Cons. Maj. D&C	99.5% Cons.	
42. *Sulfanilamide:*	0	0	0	1	33	33	54	67	54	43	28.5
Results:											
43. Cured	20	53	50	36	34	47	100	148	70	17	44.7
44. Improved	59	75	33	45	22	46	62	87	104	122	51.9
45. Died	4	5	0	4	5	6	5	5	6	0	3.2
46. % Mortality	4.81	3.83	0	5.55	8.2	6.06	3	2	3.3	0.0	3.7
47. *Avg. Days in Hospital:*	10.4	10.3	10.4	9.2	8.1	5	8.2	7.7	6.48	6.91	8.269

* 3.8 gen. aver. plus.
† Transfusions 3.41 average.

was 8.26. This gives a cross sectional picture of abortions in a representative general hospital (bed capacity, 476) at the time of this observation.

RH FACTOR

During the past few years, all of those doing obstetrics, have become increasingly conscious of this new discovery as to the cause of a rather heavy death-rate in apparently normal, newly born infants. Unfortunately, we are still rather at a loss as to what to do with these cases, unless they are born in a hospital where satisfactory donors are available and proper blood transfusions can be given at once. I refer to some interesting statistics by Lee;[3] of 616 cases tested, there were 12 per cent of Rh negative mothers; 15 per cent of an antepartum group was Rh negative. Ninety-eight husbands were tested of whom 80 were Rh positive, 14 negative. The husbands of four Rh positive women were Rh negative. Of 749 specimens tested for hospital blood banks, 14 per cent were Rh negative. These form a nucleus for the hospital's Rh Negative Donor's Club.

In seven cases of erythroblastosis reported by Lee, all the mothers, with one exception, were Rh negative. All the fathers were Rh positive; all the babies were Rh positive. The one exception could not be explained; father, mother and baby were all Rh positive. Three of the babies with erythroblastosis were saved by transfusions of Rh negative blood. All children of Rh positive parents died. Only one of the others developed any amount of agglutinins.

I cite the preceding as a warning to be on the lookout for these cases of erythroblastosis. As soon as a sufficient amount of serum is available, tests should be done routinely; certainly, if there is any history of a previous abortion which has not been satisfactorily explained.

HYDATID MOLE AND CHORIONEPITHELIOMA

We see in our practice an occasional case of hydatid mole and, still less commonly, of chorionepithelioma.

From the statistics of the Obstetrical and Gynecological Service of the Charity Hospital,[4] New Orleans, during 10 years, 85,453 pregnant women were admitted to this service. The incidence of typical hydatid mole in this period was one out of 3,049 pregnancies. Normal subsequent pregnancies occurred in 18 per cent. Two patients had recurrent moles, two and three respectively. In 1940 an analysis was published of 10 cases of chorionepithelioma in this hospital; these having occurred in the preceding 10 years. Since then four additional cases have occurred. In the present 10 year series of "full blown" moles, only two became malignant. Five of the 29 patients with moles had complete hysterectomy, which may have lowered the percentage of chorionepithelioma.

In view of these figures, I feel that steps should be instituted to lower the incidence of hydatid mole degeneration, as well as of infections and continued bleeding from retained products of conception, in cases of abortion before the third month of pregnancy. Curettage is advocated, this to be performed twenty-four hours after the occurrence of the abortion, if the patient's temperature remains normal; if sepsis is present, there should be a delay of five days after the temperature has returned to normal.

In the younger patients, conservative treatment of such moles is generally used, unless there is definite indication of malignancy. If the patient is 35 or more, however, hysterectomy is usually a safer procedure. In all such cases, regardless of age, where treatment has

been conservative, frequent laboratory examinations should be made to determine whether any retained products of pregnancy or gonadotropic substances remain. If these tests reveal any evidence of malignancy, radical treatment should be instituted at once; otherwise we may get metastases to the lung, brain or other structures. These patients should always be instructed to return regularly for reëxamination.

CARCINOMA OF THE CERVIX COINCIDENT WITH PREGNANCY

During 32 years, there were admitted to the Mayo Clinic, 3,570 cases of carcinoma of the cervix[5] with pregnancy present in 26, or 0.7 per cent, when the carcinoma was found. This pregnancy may occur after carcinoma has developed; the average age of the 26 patients being 32 years. In the past, there has been no set rule for the treatment of carcinoma of the cervix in pregnant women, but in the first trimester, the fetus has generally been disregarded. Radium, X-ray and surgery are the safest treatment here as well as in the second trimester; in giving treatment, we should still consider the mother's welfare first. In the third trimester, radium may be used as soon as it is felt that a viable baby may be gotten by cesarean section. The cervix of every patient who is thought to be pregnant, should be visualized with a speculum on the first examination. If we do this, we will find some of these early cases of carcinoma and save a few lives which would otherwise be lost. It has been suggested that the proportion of abnormal fetuses resulting from radiation might run as high as 20 per cent; we feel that this figure would be too high if treatment were given after the fetus is fairly well developed.

THIRD DEGREE LACERATIONS AT DELIVERY

Most obstetricians will attempt to do repairs at the time the injury occurs, if conditions are favorable. If, however, the patient is delivered in her home or where surroundings are not favorable to asepsis, it is better to delay this work until she can be sent to a hospital where a surgical set-up can be had. If complications arise, they will usually do so within ten days or two weeks. The question then presents itself as to whether it is wiser to do secondary repair then, or wait until later. If properly done at the time, good results may usually be expected. When the perineum has been repaired and the sphincter ani brought together without great tension, the sphincter may be cut posteriorly under the mucous membrane so as to relieve all tension on the sutures. This will heal as quickly as does the anterior lesion and takes the tension off the repaired sphincter. The longer the delay in operating after laceration, the more retraction there will be of muscles and mucous surfaces.

DYSPAREUNIA

This condition may be classified as primary or secondary; the primary group including those cases in which coitus has always been painful; the secondary, those where it was not so in the beginning, but became so later. Some patients experience slight discomfort for a short time at first coitus, but this will disappear shortly unless some disease or other pathological condition is present. In recently married women, it is usually due to some disturbance about the vulva. There may also be a certain amount of dyspareunia for a short time after childbirth, but unless there is some definite pathological condition left behind, this will soon clear up. There are also those women who are nervous or psychically disturbed, as well as those who are

harassed by sexual intercourse because of repugnance to the man concerned. There may also be recurrent pain in the frigid. The seat of stimulation may also be a factor; in the younger groups, the clitoris is the chief point of stimulation while in the mature, the vagina is more sensitive.

It is imperative that the physician make an accurate estimate of the cause or causes involved. He must determine precisely whether definite pathology is present, and if not, whether mental or physical causes are at the bottom of the trouble; whether pain results from frigidity, from endocrine imbalance, from some psychic disturbance, or a combination of these. He must then treat whatever physical condition he may find, at the same time advising the patient of the true state of affairs—which two procedures together often result in satisfactory adjustment without further trouble.

ECTOPIC PREGNANCY

Some of the most dramatic cases that we have to deal with in gynecology or abdominal surgery, are those involving ruptured ectopic pregnancies. These patients are so desperately ill in so short a time after the rupture, that unless their condition is promptly diagnosed correctly, disaster may result. Farrell and Scheffey [6] analyzed 75 cases and made a comparison with 82 previous cases which they had studied. The 75 made up 1.3 per cent of the gynecological admissions to their service. The gross incidence of pelvic inflammatory diseases was listed as 40 per cent. Abdominal pain was present in all cases and 93, or 59 per cent, had had irregular menstruations. Pelvic masses could be outlined in 59 per cent.

The laboratory picture of tubal abortion or ruptured ectopic pregnancy shows much early inflammation, under which circumstances, we would expect to find the following: (1) decrease in red blood cells, (2) increase in white blood cells, (3) decrease in hemoglobin and (4) increase in sedimentation rate. Physical findings show that these patients normally are in shock or are suffering excruciating pain. They have extreme tenderness over the abdomen, particularly over the lower half; there may also be shoulder pain such as results from from irritation of the diaphragm by free blood in the abdominal cavity. This may resemble the pain a patient feels while taking a Rubin test, where the carbon dioxide goes through into the upper abdomen and irritates the phrenic nerve.

In this study, these authors listed the proportion of correct diagnoses as 76 per cent; the total mortality, 2.3 per cent; operative mortality, 1.9 per cent. In their first series, the mortality rate was 2.5 per cent as compared with 1.3 per cent for the later series.

There are some who advocate delaying operation until a transfusion can be given to get the patient out of shock before surgery is attempted. Personally, I feel that as soon as the condition has been diagnosed as a ruptured ectopic pregnancy, a transfusion should be given and surgery done at once to stop the hemorrhage. It is rather remarkable how quickly a patient will come out of shock and a smooth convalescence will be started. "Where there is delayed or missed menstrual period or an unusual type of flow with history of sudden abdominal pain and possibly the onset of a slight vaginal bleeding—think of an ectopic."

GENITAL FISTULAE IN WOMEN

J. Marion Sims is spoken of as the father of modern gynecology. This is based on his operations on vesicovaginal fistulae. His first successful operation

was done on a slave girl in Montgomery, Alabama, in 1849.* His reward came after the thirteenth attempt at closure on this patient. The use of silver wire made it possible for him to attain the desired result. These vesicovaginal fistulae are usually from one of three causes: poor obstetrics, bungling surgery or ill-judged radium or roentgen-ray therapy.

Today, we do not see so many cases resulting from obstetrical trauma, due to improved technics and hospital facilities and to shortened labors. Surgical cases are chiefly due to hysterectomy, usually resulting from trauma to tissues by a hemostat with subsequent sloughing through the bladder wall.

Fistulae which follow radium or X-ray therapy are quite prevalent. So far, we have been unable to do much to prevent them beyond the usual caution of screening healthy tissue from the rays. Patients who have had radium applied to the fundus or cervix should have post-radiation examinations routinely. Many of these patients will be cured of the malignancy for which the radium was applied, only to develop stricture of the ureters and "die kidney deaths" from ureteral obstruction.

Some of the patients with injuries which result in third degree lacerations of the perineum, will incidentally develop rectovaginal fistulae which might have been prevented by episiotomy, manual dilation and massage of the perineum and vagina. Phaneuf [7] gave a remarkable report of 110 cases he operated on for vesicovaginal fistulae in which he obtained satisfactory end results in 108. The preoperative use of sulfasuxide was very helpful in these cases as it controlled the flora of the intestinal tract, thereby lessening the incidence of infection.

Anyone doing abdominal or pelvic surgery should be thoroughly familiar with the anatomy; where there is a question of the ureter being involved, if necessary, pass ureteral catheters to identify the ureters before any cutting is done. Following are some of the qualifications for the surgeon attempting this type of work: (a) knowledge of the field of operation, (b) presence of mind, (c) ability to identify tissues before cutting, (d) ability to make satisfactory preliminary exposure, (e) knowledge of what conditions indicate the need for cystoscopic examination and the passage of catheters, (f) skill to limit isolation and denudation of ureters, (g) knowledge of the use of early-absorbable sutures where work is close to the ureters, (h) ability to avoid postoperative infection or injury by care in catheterization and avoidance of rigid catheters, an overdistended bladder, and the like. The first danger zone for the ureters is where they cross the iliac vessels, the second is about the ovarian fossa.

Ureteral obstructions are often found to be quite extensive if carcinoma of the cervix is present. In doubtful cases, when a retrograde pyelogram cannot be made, resort should be had to intravenous urography as this will often reveal obstructions in the upper urinary tract when inflammatory masses and tumors are present.

UTERINE BLEEDING [8]

In uterine bleeding three definite periods of life should be considered: (1) puberty, (2) adolescence and the child-bearing years (menstrual life), (3) postclimacteric. We did a study of 107 cases by endometrial biopsy. The following shows in brief the findings in these cases:

* Those of us who live in Alabama have a right to be proud of Dr. Sims. His son-in-law, Dr. John A. Wyeth, was founder of the New York Polyclinic—the first postgraduate medical school in the world.

TABLE II
107 Cases, Total Biopsies 267

	Proliferative Phase Late and Early	Secretory Phase Late and Early	Hyperplasia of Endometrium	Glandular Hyperplasia	Polypoid Hyperplasia	Endometrial Glandular Dysplasia	Cystic Glandular Dysplasia	Placenta Tissue	Malignant Adenoma	Atrophic Endometrium
Number of biopsies.....	95	95	28	2	2	3	1	15	3	23
Per cent of total biopsies.....	35.5	35.5	10.4	.74	.74	1.08	.3	5.5*	1.08†	8.6

* This is the percentage of total biopsies taken; the percentage of placental tissue found in 107 cases was 14.
† This is the percentage of total 267 biopsies taken.

The percentage of malignancies in 107 cases, was 2.8. This shows the different types of endometrial tissues which were found as well as placental tissue in 14 per cent of the 107 cases. Many of these patients gave no history of knowing that they had been pregnant; pregnancy in others had taken place several years prior to the taking of the biopsies. This indicates that placental tissue remains in the uterine cavity for long periods after pregnancy has ended. This study was made primarily in cases of bleeding suspected to be of endocrine origin, other than those which might have cancer. However, of this number, there were 3 (or 2.8 per cent) in whom malignancies were found.

CONCLUSIONS

1. Seventy-five white and 32 colored patients were studied.

2. In this study of 107 cases, over a period of 3 years, the average age of patients was 38, the youngest being 14, the oldest, 69.

3. The average number of biopsies was 2.4 (ranging from 1 to 24) per patient.

4. The proportion of positive Wassermann reactions was 7.1 per cent (for both white and colored). This was not, in our opinion, any great factor as a cause of bleeding.

5. The percentage of unsuspected malignancies found in this group was 2.8. The ages of the patients so affected, were 26, 51 and 59 years respectively.

6. There were in the group, 15 (or 14 per cent) who had retained placental tissue.

7. The menstrual cycle is definitely under the control of the endocrine system. The glands bearing a fundamental relation to this function are the anterior hypophysis, the ovaries and the thyroid.

8. A diagnosis of irregular menstruation as a pathological condition should always be made cautiously, owing to the variation of the cycles of normal individuals.

9. An examination of the endometrial tissue is of great importance, as it closely reflects the functional activity of the ovaries in most cases of abnormal bleeding.

SUMMARY

The author reviews, under separate subheadings, a number of the more commonly encountered problems of gynecological and obstetrical practice. He recites his own observations, also the published observations of others, on some of these topics. He gives, in both text and tabular form, the results of ten years' study in a representative general hospital in a southern city (bed capacity, 476).

SOMMAIRE

L'auteur passe en revue, sous différents sou-titres, les problèmes les plus frequénts, qu'on rencontre dans la pratique gynécologigue et dans la pratique obstétricale. Il nous récite ses observations personnelles et celles d'autres observateurs. Il nous donne sous formes classifiées les rêsultats de dix ans d'étude dans un des grands hôpitaux d'une ville du sud (capacité, 472 lits).

(Continued on page 347)

Herniation of Subfascial Fat as a Cause of Low Back Pain

Results of Surgical Treatment in Thirty-one Cases*

RALPH HERZ, M.D.
CLEVELAND, OHIO

PHYSICIANS and surgeons still have much to learn about low back pain, which is one of the commonest complaints encountered in medical practice. When all known causes of low back pain have been excluded, many cases still remain in an undifferentiated group. There are widely divergent opinions as to the cause of the pain in these instances. Much has been written about "fibrositis" and trigger points. These are painful pressure points that can be elicited by palpation and relieved by injections of some anesthetic solution, but opinion varies as to the underlying lesion in these cases, or the mechanism of pain production.

Recently I have observed a series of patients with these trigger points of pain and spasticity of the muscles of the back in whom disappearance of back pain followed surgical removal of a nodule of fat in the painful area. This report extends and amplifies that published in July, 1945.[1] My observations, which coincide with those published in England last year by Copeman and Ackerman,[2] show that herniations of subfascial fat account for some, perhaps for a considerable number, of cases of severe low back pain that have hitherto fallen into an undifferentiated group.

Case 1. In January 1937, I saw a patient who was suffering from excruciating pain in the back. She could not turn in bed nor could she rise from a sitting position without aid. Deep palpation revealed a very tender nodule over the left side of the sacrum, about 5 centimeters from the spine and equidistant from the crest of the ileum. Pressure over this nodule produced severe radiating pain. Circuminjection with 2 per cent procaine solution caused immediate relief of pain and spasm, but these recurred when the anesthetic solution was absorbed. Subsequent injections gave similar temporary relief. Biopsy was suggested but was refused at that time. Finally, after repeated disabling attacks, she consented to an operation in May, 1945; since removal of the fatty nodule she has had continuous relief.

Case 2. In October, 1943, I observed another patient, also a woman, with very severe acute low back pain; examination revealed an extremely tender, palpable nodule on the right side of the sacrum. Circuminjection with 2 per cent metycaine gave immediate relief. The patient had a history of "lumbago" of several years' duration. Often when she stooped, she could not rise unaided; during acute exacerbations, she could not turn in bed. The nodule in this case was hard, freely movable, about 5 centimeters in diameter, and felt like an encapsulated tumor. The patient agreed to an operation.

Upon incision over the nodule, the fat tissue welled into the incision and part of this was excised. A search was made for the painful nodule, but it could not be located, even though the fat was removed down to the fascia of the gluteus muscle. The specimen was examined very carefully, but no tumor tissue was found. There were simply two similar lobulated masses of fat, roughly round and measuring 5 centimeters in diameter. Sections showed homogeneous yellow fat, slightly lobulated. When I saw the patient later in the day, after the effect of the anesthetic had disappeared, she volunteered the information that the pain in her back was entirely relieved. She has had no recurrence of this difficulty during the two years since.

* Read at Tenth Annual Assembly, U. S. Chapter, International College of Surgeons, Washington, D. C., December, 1945.

In December 1943, and again in February 1944, I operated on patients with similar disabling syndromes, who also had palpable nodules in the back which were trigger points of pain, and were relieved temporarily by local in-

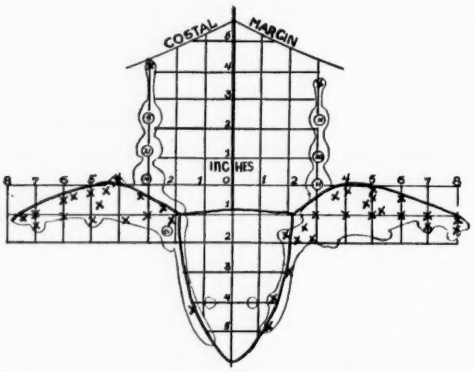


Fig. 1.—Situation of "trigger points" of pain (after Copeman and Ackerman).

jection of anesthetic solution. In both instances, the only tissue removed was fat, and both showed the same striking clinical improvement as the first.

Since histopathologic examination of excised tissue showed no change which could account for the relief these patients obtained, an anatomic explanation was sought. I consulted Dr. Normand L. Hoerr, Professor of Anatomy at Western Reserve University, on this point. Search in anatomy texts and atlases failed to yield any clew. However, when Copeman and Ackerman published their clinical and anatomic study disclosing that herniations of fascial fat were the basis for trigger points of pain in so-called fibrositis, it seemed probable that this type of lesion had accounted for the back pain, and its striking relief by surgery, in the cases I had observed.

When they inaugurated their study on "fibrositis," these authors first sought, and expected to find, a lesion of fibrous tissue accounting for the trigger points of pain. They first charted the situation of trigger points in patients with "fibrositis," and found that they were located consistently in certain parts of the back. Later, in dissections of fourteen cadavers, they found that the situation of trigger points (fig. 1) coincided almost exactly with the basic fat pattern in the back (fig. 2). They found that beneath the subcutaneous fat and areolar tissue lies the highly vascular superficial fascia, which forms a continuous sheet from the neck to the gluteal region. Space between this and the deep fascia is principally potential, containing little or no fat. In certain well defined places, however, deposits of pink fat constantly

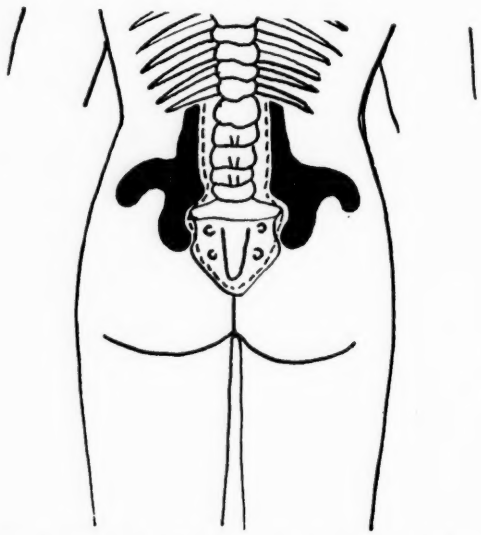


Fig. 2.—Basic fat pattern in the lower back (after Copeman and Ackerman).

occur. These, with equally constant deep areas, constitute the basic fat pattern. In obese persons, this fat pattern tends to be obscured by more generalized deposition of fat. The fascias are not of uniform thickness, being notably thinner in certain places; frequently there are actual deficiencies in the

fascial membranes. In these places, the underlying fat tends to bulge through, sometimes resulting in complete herniation (fat hernia). These small hernias tend to occur at points where the fascia is weak and do not give rise to symptoms until some incident, such as sudden trauma or some pyrexial illness (entailing lying on the back for several days) produces an increase in pressure and a painful degree of distention. This leads to edema, which may perpetuate the condition.

Copeman and Ackerman also described ten cases (all in men in the armed services) in which fatty tumors were excised, with striking relief of back pain that had been severe and disabling.

This report, which shed considerable light on the subject of these painful fatty nodules, and offered a likely explanation of the clinical results that I had observed, led me to the dissecting room, where I have dissected the backs of two cadavers. One of these was cachectic; the other had been well nourished. The findings were essentially the same as those reported by Copeman and Ackerman. In the cachectic specimen, on dissection of a skin flap from the level of the last dorsal vertebra to the left trochanter, and laterally to about the anterior superior spine of the ilium, the superficial fat pads were distributed in a regular pattern. The superficial layer of the superficial fascia was then dissected and reflected by a longitudinal incision. Distribution of fat pads followed essentially the same pattern as that of the superficial fat between the skin and superficial fascia (fig. 3). The deep layer of the superficial fascia was then dissected by making a longitudinal incision and reflecting this fascia laterally and mesially. Exposure of this area revealed a large fat pad lying over the gluteal region about 3 centimeters from the spine (midline), and extending below the level of the posterior superior spine of the ilium. This fat pad was roughly 10 x 15 centimeters and varied from 0.4 to 0.8 centimeters in thickness. It was attached loosely to the deep layer

Fig. 3.—Situation of basic fat in relation to the gluteal muscle as shown by dissection.

of the superficial fascia and to the fascia and the fibers of the gluteus maximus muscle. The deep layer of the superficial fascia had several weak areas, through which this fat could very easily be forced into the space between the two layers of the superficial fascia. In this specimen, the space between the two layers was small, because the amount of fat was minimal. Dissection on the other side revealed essentially the same findings, which, with minor variations, are consistent with those found in the other cadaver.

I have, to date, operated on thirty-one patients with this type of back pain, and have observed these herniations. The clinical results following removal of the fat hernia have been almost uniformly

good. Twenty-eight patients have had complete relief of disabling back pain. In two, the results have not been satisfactory. In the other case, the outcome is doubtful. In addition to these cases in which operation has been performed, I have also observed fifty-four patients whose back pain is apparently due to this same cause. These patients have one or more palpable nodules which are trigger points of pain, and have been relieved by circuminjection with anesthetic solution (Table 1). Some of these

TABLE 1

Herniations of Subfascial Fat
Clinical Experience

Total cases	85
Males, 28; Females, 57	
Trigger points of pain	85
Relief by circuminjection of anesthetic solution	82
Operation performed	31
Relief following operation	28

patients can be kept comfortable by repeated injections of anesthetic solution; some will probably come to operation later.

These anatomic and clinical observations indicate that herniations of subfascial fat may occur through weak points in the superficial fascial layer and membrane, and that these fat hernias may be the cause of disabling back pain. This cause of low back pain has not been generally recognized. Besides the excellent contribution by Copeman and Ackerman, the only allusion to this condition that I have found in the literature was published by Sutro,[3] in 1935. He described subcutaneous fatty nodes in the sacroiliac area, and reported one case in which low back pain was relieved immediately and permanently by removal of such a fatty nodule. In four instances in which the fatty nodule was removed, the tissue was apparently normal adult adipose tissue, somewhat lobulated. He reported that in 170 unselected hospital patients suffering from various complaints, subcutaneous nodes were palpated in the sacroiliac region in ninety-four. In forty-five, they were present unilaterally and in forty-nine they were bilateral. While nodules were noted in thin persons, the incidence in obese women past middle age was generally highest. Thirty-three of these ninety-four patients had low back pain of muscular-skeletal origin. Sixteen of these thirty-three had tender nodules in the sacroiliac region.

The typical story in the cases I have observed, is that there is a history of trauma due to strain which initiated the pain. In all instances, the pain in the back is extremely severe and often is referred down one leg. In some, there have been recurrent attacks of such pain for many years, which had been periodically incapacitating. In many instances, the patients could not turn in bed during these exacerbations. In all cases a definite mass was palpable. This was extremely tender; pressure on it intensified the pain. Important diagnostic features are the severity of the pain, the frequent history of trauma, the frequency of radiating pain, the presence of a palpable tender mass which is a trigger point of pain and can be relieved temporarily by injection with an anesthetic solution.

The following additional case histories are illustrative and typical of the findings and clinical results:

Case 3. A truck driver, aged 33, had injured his back in a fall from a truck, two months previously. His back became so stiff that he could not bend over. He became fatigued easily and had increasing pain in the back. This was especially severe at night, when he had to change his position frequently. For the past two weeks, there had been radiating pain down the right thigh. Since the injury, he had consulted several physicians.

He had received various forms of physical therapy and had been advised to wear a brace.

Physical examination revealed a hard, circumscribed irregular nodule over the right side of the sacrum near the sacroiliac junction. There were also tender trigger points over the left side of the sacrum. The one on the right was extremely tender to palpation and appeared to be attached to underlying structures. At operation, multiple fat lobules were found in the right gluteal region. These were all exposed and dissected widely. Five small lobulated masses of fat were removed from the left gluteal region. Hernial openings in the fascias were located and sutured. The skin on both sides was closed with a subcuticular suture of alloy steel wire No. 30.

Tissue from the right sacroiliac region consisted of fourteen small, roughly rounded fragments measuring from 0.5 to 2 centimeters in diameter. The material was moderately firm, lobulated, hyperemic, homogeneous fat. Two fragments were brownish red, tough and consisted principally of fibrous tissue. Tissue from the left sacroiliac region was composed of five similar small, roughly rounded, lobulated fragments of homogeneous yellow adipose tissue measuring from 0.8 to 2 centimeters in diameter. Sections showed mature homogeneous, lobulated fat which was the seat of slight focal edema and hemorrhage. There was partial lobulation by dense bands of relatively acellular collagenous connective tissue. Some of the latter contained small nerves. There were foci of edema and infiltration of moderate numbers of lymphocytes and polymorphonuclear leukocytes sometimes in perivascular location. The pathologic diagnosis was adipose tissue, the seat of focal subacute inflammation.

The patient had immediate relief from the severe back pain, and has been perfectly well for three months. He reports that he can run, bend and work without any trouble.

Case 4. A woman, aged 33, had had severe back pain for two years. It was an ordeal to stoop over or be on her feet for any length of time. There was constant dull pain in the lower back which extended down the right leg, and at times became "almost unbearable." Examination revealed palpable painful nodules over both sides of the sacrum; these were temporarily relieved by circuminjection of anesthetic solution.

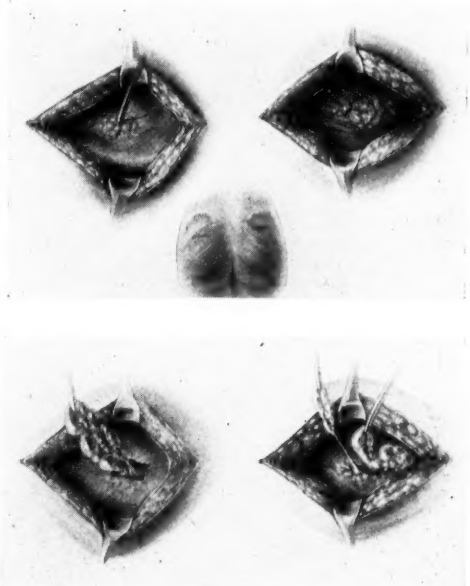


Fig. 4.—Technic of operation for removal of bilateral subfascial fat hernias.

At operation, a wide dissection of fat was made on both sides. The patient's back pain was relieved immediately, and she was up out of bed three hours after the operation. Three weeks after she returned home, she did her own laundry and drove her car. Six weeks later she was back on her bowling team and experienced no pain or sequelae from this exercise.

The tissue removed from the left side consisted of irregularly shaped pieces of yellow lobulated fat, measuring 5 x 5 x 3.5 centimeters. There were also numerous smaller pieces of fatty tissue. The tissue removed from the right side included four pieces of soft, pale yellow, lobulated fat, with intermingled fine gray bands of fibrous tissue, measuring from 2.5 x 5.5 x 1.5 centimeters up to 8 x 5 x 3 centimeters, and numerous smaller pieces of finely lobulated fat. Microscopic ex-

amination showed mature fibroadipose tissue, with fat predominating. One section showed infiltration of many eosinophils, lymphocytes and large mononuclear cells, indicating chronic inflammation. The pathologic diagnosis was fibroadipose tissue and fibroadipose tissue with chronic inflammation.

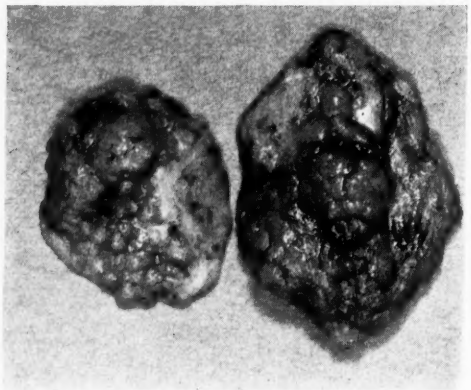


Fig. 5.—Specimens removed (Case 2) showing definite herniated lobules in surrounding fatty mass.

From a surgical standpoint, removal of the palpable fat mass presents some difficulty, especially when there is considerable superficial fatty tissue. In some instances, it has not been possible to see a definite mass that could be clearly differentiated as the palpable nodule; in others, the definitely lobulated mass is easily discernible. When the palpable nodule (herniation of fascial fat) cannot be clearly differentiated from the overlying superficial fat, a wide dissection of fat should be made down to the fascia itself (figs. 4 and 5). After excision of this fatty mass, the fascial layer should be carefully explored. In some instances, the weak point through which the herniation occurred can be determined; this should be sutured. I prefer to close the wound with a small rubber drain, using a subcuticular suture of alloy steel wire No. 30.

From the anatomic studies, it seems probable that these herniations may exist potentially or actually in many persons without causing severe symptoms. The role of trauma in initiation of symptoms should be stressed. Copeman and Ackerman also mentioned the role of continuous bed rest in producing an increase in fat pressure and a painful degree of distention. When the distention of the fat lobule is of sufficient degree, the blood supply to the fat is interfered with and edema and occasional hemorrhage occur. These changes initiate the symptoms. It seems plausible that, with subsidence of hemorrhage and focal edema in the fat lobule, there may also be subsidence of symptoms, with later recurrence following even a slight precipitating strain. From the histories related by some patients, this would seem to be what had happened. In others, in whom the disability is more or less chronic, it would appear that the edematous condition does not subside sufficiently to bring relief; the herniation becomes strangulated and fixed, perhaps with development of fibrous tissue.

The pathologic changes in these cases are not of great significance. The specimen removed usually consists of mature adipose tissue, sometimes definitely lobulated (fig. 6). In some cases the lobule of fat has a pedicle, probably the result of long-standing strangulation of the fat hernia. Occasionally there is young fibrous tissue growing into the fat. The fat tissue usually shows edema and hemorrhage. In one case in this series, there were lobulated groups of mature adipose cells separated by dense bands of fibrous connective tissue, which in some places exhibited edema and focal hemorrhage. In one instance, nerve tissue was found in the fat lobule.

The majority of patients in this series were women; only eight of the thirty-

one patients operated upon were men. Since the first seven patients I saw all were women, I thought at first that perhaps the condition was confined to females. However, all ten cases reported by Copeman and Ackerman were in men, and in the past six months I have seen twenty-eight men suffering from this type of condition. In his report on the incidence of fatty nodes in the sacroiliac region in 170 hospital patients, Sutro commented that while they were sometimes noted in thin persons, the incidence in obese women past middle age was generally highest. This observation agrees with my clinical experience, in which two-thirds of the patients were women.

SUMMARY AND CONCLUSIONS

In a series of thirty-one cases, excruciating pain in the back, sometimes accompanied by leg pain, has been relieved by surgical removal of a herniated tumor of subfascial fat. In many instances there was a history of trauma as the precipitating cause of back pain, often with a history of recurrent attacks. In all instances, there was a palpable mass which proved to be a trigger point of pain, and the diagnosis was confirmed by injections of anesthetic solutions around the mass, which produced prompt though temporary relief. In addition to these thirty-one patients who have been subjected to surgical treatment, I have also observed fifty-four patients with a similar condition, relieved by local anesthetic injections, who have not been operated upon.

Anatomic dissections reported by Copeman and Ackerman, in England, and those that I have made, explain and confirm these clinical observations. In the back, the distribution of fat underneath the superficial fascia follows a consistent pattern (basic fat pattern) which coincides with the areas in which trigger points of pain are found in cases of low back disability. The dissections show that at certain points, the fascial fibers and membrane are weak; herniations of the subfascial fat may easily occur at these places. Sudden strain precipitates the herniation of fatty tissue, which then becomes edematous, causing pressure which may lead to severe and disabling back pain.

Since pain in the back is such a common cause of disability, it is important to isolate the definite cause whenever possible. There are many known causes of back pain for which there are standard treatments, but there are also many cases in which the cause is obscure and the patient gets little or no relief from symptomatic treatment. It seems probable that some patients (perhaps a fairly large proportion) in whom the cause of back pain has not been diagnosed previously, may have herniations of fascial fat, surgical removal of which may bring prompt and lasting relief. Because a history of trauma due to strain is so common in these cases, it seems obvious that many of the cases of so-called nonspecific traumatic back disability may fall in this group. Hence the condition has significance in relation to industrial medicine and compensation cases. Another group of cases in which this condition may frequently be found is that of so-called chronic fibrositis. In this condition, nodules can often be palpated which prove to be trigger points of pain and can be relieved by local injections of anesthetic solution. It is also my impression that some, perhaps many, cases of so-called functional back pain, which is considered to be psychogenic, may be due to subfascial fat hernias.

This operation is not presented as a panacea for all types of low back pain.

However, it seems certain that if the possibility of such a lesion is recognized and if careful examination is made for palpable masses which may prove to be trigger points of pain, numerous patients may, by this procedure, be relieved of a condition that has incapacitated them, sometimes for many years.

RÉSUMÉ

Dans une série de 31 cas observés par l'auteur, l'ablation d'une tumeur adipeuse herniée fut suivie du soulagement d'atroces douleurs du dos. De ces cas, et aussi d'un grand groupe présentant les mêmes symptômes, l'auteur est d'avis que chez des malades souffrant de douleur dans le bas dos, on doit en l'absence d'autres états pathologiques, songer à l'existence d'une hernie adipeuse se frayant un chemin à travers le fascia. Les observations, ainsi que celles de deux chirurgiéns anglais qui ont étudié le question, l'ont conduit à croire que cette condition se rencontre le plus souvent chez les femmes obèses. Néanmoins, il a observé cette condition chez des hommes et des femmes non-obèses. L'enlèvement chirurgical de des masses est suivi d'un soulagement complet et permanent de la douleur.

RESUMEN

En una serie de 31 casos observados por el autor, la presencia de intenso dolor lumbo-sacro fué aliviado mediante la extirpación quirúrgica de un tumor graso subfascial herniado. Fundándose en los resultados de estos casos y en los antecedentes de un gran grupo con síntomas similares, que todavía no han sido objeto de intervención quirúrgica, el autor estima que muchas personas que aquejan dolor lumbo-sacro, de causa inexplicable, puede ser que tengan tales hernias grasas a traves de la fascia. Sus propias observaciones y las de dos cirujanos ingleses que trabajan en éste mismo sentido, han convencido al autor que las personas que presentan este estado patológico son mujeres de edad mediana y obesas, aunque él y los mencionados cirujanos ingleses han podido ver las referidas hernias en otros tipos físicos tanto en hombres como en mujeres. La extirpación quirúrgicas de los nódulos responsables del dolor, proporciona casi siempre la completa y permanente desaparición del dolor.

Свод.

В серии 31 случаев, изученных автором, мучительная спинная боль была облегчена удалением грыжи подфасциального жира. На основании этих случаев, а также большей группы с подобными симптомами, которые еще не были оперированы, автор думает, что многие больные, страдающие от иначе необ'яснимой низкой спинной боли, имеют такую грыжу жировой оболочки через фасцию. Его наблюдения, а также двух английских хирургов, убедили его, что большинство таких больных это жирные женщины среднего возраста, хотя эти грыжи были найдены и в других физических типах, как в мужчинах, так и в женщинах. Операция для удаления болезненных нодюл почти всегда приносит полное и постоянное излечение боли.

REFERENCES

1. Herz, Ralph: Herniation of fascial fat as a cause of low back pain: with relief by surgery in six cases. J. A. M. A. **128**:921–925 (July 28) 1945.
2. Copeman, W. S. C., and Ackerman, W. L.: "Fibrositis" of the back. Quart. J. Med. 13:37–51 (Apr.–Jul.) 1944.
3. Sutro, C. J.: Subcutaneous fatty nodes in the sacroiliac area. Am. J. M. Sc. **190**:833–837 (Dec.) 1935.

(Continued from page 331)

as to be a subject for discharge to civil life, to prepare him fully for readjustment and to making his own successful way in spite of whatever handicap he may have acquired.

RÉSUMÉ

Après une brève revue des méthodes de réhabilation employées pour le soulagement physiques des mutilés des guerres précédentes l'auteur nous décrit en detail l'ouvrage que le Navy Department de la deuxième guerre mondiale est en train d'accomplir. Les objectifs de ces méthodes est de restaurer le blessé en excellente santé physique et mentale; si l'état du blessé est tel qu'il doit étre retourné à le vie civile on le prepare pour qu'il s'adapte á son entourage et qu'il puisee réusser dans la vie malgré les désavantages causés par son état de mutilé.

RESUMEN

Después de hacer una breve revista del trabajo de reabilitación de los iválidos, combatientes en guerras anteriores, el autor describe con gran detalle lo que se ha hecho a este respecto en la Armada de los Estados Unidos durante la pasada Guerra Mundial. Hace especial hincapie sobre el objetivo de la reabilitación que es, en substancia, el retorno del individuo incapacitado a la completa normalidad funcional en la vida ordinaria o, en todo caso, si la invalidez es tal que no se le puede restaurar a la total normalidad, readaptarlo a una nueva vida en que pueda ser util a pesar de la incapacidad que presente.

Свод.

После краткого обзора работы реабилитации инвалидов прежних войн автор довольно детально описывает работу в этом направлении северно-американского флота во второй мировой войне. Он особенно подчеркивает цели этой реабилитации: 1) возвращение бойца на службу в полном физическом и духовном здоровье, 2) если он так поврежден, что должен быть уволен со службы в штатскую жизнь, то необходима подготовка его к полному приспособлению и успеху в жизни, несмотря на степень приобретенного повреждения.

(Continued from page 338)

RESUMEN

El autor analiza, bajo subtítulos diferentes, los problemas más frecuentemente confrontados en la práctica ginecológica y obstétrica. Estudia sus propias observaciones, las experiencias de otros autores y, en fin, algunos otros temas sobre el particular. Concluye haciendo, en forma desciptiva y con cuadros, un resumen de diez años de experiencia en un hospital general representativo en una cuidad del sur de los EE.UU., con una capacidad de 476 camas.

Свод.

В отдельных главах автор дает обозрение наиболее частых задач, возникающих в гинекологической и акушерской практике. В некоторых случаях он дает наблюдения, как собственные, так и других авторов. В описательной и табличной форме он дает результаты десятилетнего опыта в типичном 476 коечном госпитале в южном городе.

REFERENCES

1. Meaker, S. R., J. A. M. A. **123**:680–682 (Nov. 13) 1943.
2. Douglas, G. F., Ten Year Study of Abortion, Hillman Hospital (University), Birmingham, Ala., Ob.-Gyn. Dept., 1933–1942.
3. Lee, F. P. *et al*, J. A. M. A. **128**:1, 19 (May 5) 1945.
4. Jeffrey, E. M., and Graffagnino, P., West. J. Surg. **52**:29–30 (Jan.) 1944.
5. Maino, Charles R., Mussey, Rogert D., Am. J. Obst. & Gynec. **47**:222–224 (Feb.) 1944.
6. Farrel and Scheffey, Am. J. Obst. & Gynec. **46**:686–695 (Nov.) 1943.
7. Phaneuf, L. E., Am. J. Surg. **64**:3–27 (Apr.) 1944.
8. Douglas, G. F., Am. J. Obst. & Gynec. (Apr.) 1941.

Primary Malignant Disease of the Stomach

RICHARD H. LAWLER, M.D., F.A.C.S., F.I.C.S.
CHICAGO, ILLINOIS

PRIMARY malignant disease of the stomach constitutes one of the greatest and gravest problems in medical practice. It should occupy a most important place in the thinking of the medical profession and the laity when considering the incidence and annual mortality rate. In the United States, despite steady improvement in the standards of medical practice throughout the country, the incidence of this disease is steadily increasing.

Complete surgical removal of malignant lesions of the stomach remains the best method of treatment. Cancer of the stomach is always such a serious illness, that it demands prompt recognition and treatment to prevent a fatal termination. It is evident therefore, that if results in the treatment of malignant gastric lesions are to produce improvement, more responsibility in early recognition of the lesions must be assumed by the clinician who is first consulted by the patient. It is important to realize that the symptoms of carcinoma of the stomach are not always typical and clear cut; many do not present a text book picture of signs and symptoms. Unfortunately those patients who do present a text book picture of carcinoma of the stomach are in so far advanced a stage of the disease, that they offer little hope for successful surgical removal.

In order that the diagnosis may be made early, it is essential that the clinician be willing to subject to roentgenologic and gastroscopic examination, many patients about whom he may entertain only the suspicion that they have the disease. The number of early, resectable lesions thus discovered will more than justify any inconvenience to the patient.

In a fairly large number of instances, the surgeon will find that radical resection is essentially only a palliative operation. Until a biologic test becomes available to suggest that a patient harbors a malignant growth somewhere in his body, late recognition in many cases undoubtedly will continue. The tragedy of the situation is that carcinoma *per se*, certainly in the beginning, gives no symptoms at a time when it is a curable, resectable lesion. Gastric carcinoma is not, as so many patients and a few physicians still believe, a hopeless disease.

With improvement in preoperative preparation, technic and equipment, anesthetic methods and postoperative care, surgeons have greatly widened the field of operability on cancer of the stomach. Total removal of the stomach, which was regarded as a rarity only a few short years ago, is now a relatively frequent procedure. While the results of total gastrectomy have not been too brilliant, the aggregate of patients who have survived for from one to several years after such an extensive procedure, in reasonable comfort, must be considered.

The increase in the percentage of operable cases is due in part to earlier diagnosis and treatment, but in even greater part to a willingness on the part of surgeons to perform resections on patients who previously would have been considered inoperable. It would be of the utmost importance if it were possible to know and recognize exactly what anatomic and physiochemical changes take place in the stomach pre-

ceding the development of cancer. The relationship of cancer to chronic peptic ulcer of the stomach is a much debated one. Likewise the relationship between so-called chronic gastritis, with its glandular changes, and gastric carcinoma is unknown and unproved.

Cancer never develops in normal membrane. A great majority of gastric carcinomas derive from the mucus-secreting cells of the mucosa. The pyloric area is the most frequently affected; more tumors begin on the superior half of the stomach than on the inferior. The frequency with which carcinoma of the stomach has been observed in patients under medical treatment for pernicious anemia definitely suggests that all patients with that disease should have a roentgen examination of the stomach several times a year.

The spread and metastasis of gastric carcinoma. Like other carcinomas, gastric cancer spreads to other tissues by direct growth, and metastases occur through the lymphatic and blood vessels.

Physiological change associated with gastric carcinoma and toxemia of stasis. The condition itself and the chemical changes in the blood associated with it, have been described many times and are too well known to require detailed discussion here. The principal clinical features are (1) marked gastric retention, not necessarily associated with vomiting, and (2) marked dehydration with varying degrees of hemoconcentration, prostration, neuromuscular irritability, hypotension and oliguria. The characteristic chemical changes in the blood which accompany the condition are (1) hemoconcentration with shrinkage of plasma volume, (2) reduction in the fixed bases of the serum, (3) increase in urea and other nonprotein nitrogenous components of the blood, (4) diminution in plasma chlorides and (5) increasing ability of the blood to combine with carbon dioxide. Ketone bodies may appear in the urine.

The physiological mechanisms underlying these changes are not fully understood. Dehydration and deficiency of bases are of the most critical significance and are the factors most responsible for serious symptoms and death. Preoperative preparation and postoperative care of patients with carcinoma of the stomach have assumed increasing importance during the past decade. During this same period there has been a steady decline in the mortality associated with radical gastric resection. One of the common causes of mortality, especially in bad risk patients, has been inadequate preparation.

Preparation and postoperative care. Patients with operable carcinomas of the stomach require the most careful supportive treatment; the importance of adequate preparation cannot be too much stressed.

The importance of the preoperative management is now so clearly understood that few surgeons would consider operation without at least attempting to correct certain abnormalities which exist in nearly every instance in patients who come to surgery for gastric resection. The indications for therapy follow directly from knowledge and understanding of the pathologic physiology due to gastric cancer. Therapy must be directed toward correcting the infection, dilatation, atony and nutritional deficits, and the losses of fluids and electrolytes.

The administration of small amounts of dilute hydrochloric acid will lead to early disappearance of foulness of the gastric contents and more rapid reduction of the bacterial count. Vitamin B complex, vitamin C (and sometimes K) in daily doses are beneficial. The water balance, salt balance, acid-base equi-

librium and serum protein concentration must be corrected. Patients who have vomited repeatedly usually have a chloride deficiency. If anemia is present, the patient should receive multiple small transfusions of blood and plasma; 200–500 cc. per day will help

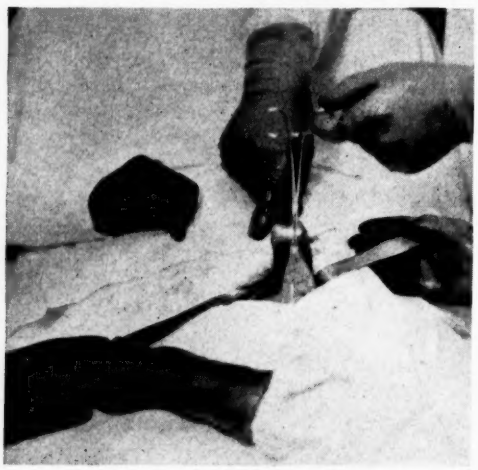


Fig. 1

to bring the serum protein level up near normal. Amino acids and glucose injected intravenously are of value in maintaining nitrogen equilibrium. Protein digest fed into the stomach or duodenum are also of value. A high protein, high carbohydrate, low fat diet should be given in the preparation of such patients for surgery. Intragastric drip feedings are sometimes used (Varco diet) with excellent results.

The operation: Patients with gastric cancer are doomed, unless the growth is removed by operation. The wisdom of removing a local malignant lesion in the presence of irremovable metastases is debatable. However if the local lesion is removed, the comfort of the patient, both mental and physical, is greatly increased. In a number of instances, the progress of the residual disease seems to have been retarded after the removal of the primary lesion. Some patients have survived much longer than one would anticipate. Thus, no criticism should be directed against the removal of a primary growth *if* it could always be removed without mortality. The removal of the greater omentum and all of the gastrocolic ligament, excision of the pylorus and the retropyloric glands and the highest possible division of the gastrohepatic ligament with its lymph glands, are now recognized as being as necessary as is removal of a wide margin of normal gastric wall beyond the cancer (suggested by Kay of Ann Arbor).

Choice of operation: The operative technic depends upon the ability and

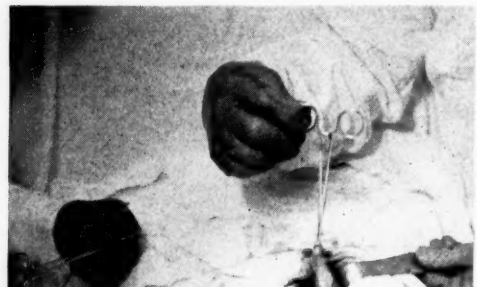


Fig. 2

choice of the individual surgeon; several types have been described many times in the literature. I prefer to do a high gastric resection with removal of at least three-fourths or four-fifths of the stomach according to the Hofmeister technic as modified by K. A. Meyer. Occasionally a high posterior

Polya type resection is done. For cancer of the cardiac end of the stomach, with or without extension to the lower esophagus, the transthoracic type of resection may be the operation of choice, although abdominal resections have produced many favorable results. Further experience with this type of resection will be necessary in order to settle this point.

In handling inoperable cases requiring gastrostomy, it is well to remember that patients who require this type of surgery are usually very poor operative risks. They are likely to be in an extremely low state of nutrition and emaciated. This, taken with the extensive pathologic and physiochemical changes which are always present, as well as extensive liver damage, low resistence to infection and poor healing powers, make them unable to withstand the severe shock of anesthesia and a long operative procedure. In such a situation I use the simple tubovalvular type of gastrostomy which has been developed in the Cook County Graduate School, a procedure which has proven very satisfactory and with low postoperative mortality.

Acute perforations of gastric or duodenal ulcers are treated by primary closure and nothing more, followed by supportive postoperative care.

Description of gastrostomy: Through a left upper paramedian incision, the stomach is exposed; the anterior wall is grasped with a Babcock forceps at the most mobile point (fig. 1). With the application of traction at this point, a portion of the anterior wall is converted into a cone shaped diverticulum. A purse string suture of braided silk is then introduced into the seromuscular layer at the base of the diverticulum and a second purse string is then applied one centimeter above the first (fig. 2). As these sutures are tightened, they will cause the base to pucker; the amount of traction on them should be regulated so as not to completely constrict the lumen (fig. 3). Interrupted black silk sutures are placed in the sero-

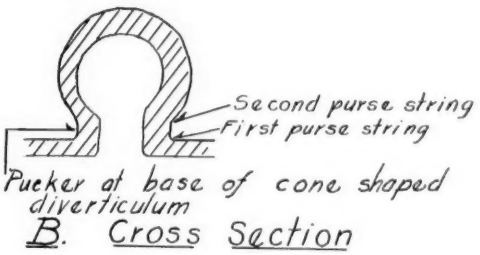


Fig. 3

muscular layer at right angles to the purse string sutures about 3/16 inch apart around the circumference (figs. 4 and 5). The anterior wall of the stomach is then fixed to the peritoneum and posterior rectus sheath with interrupted sutures. The anterior rectus sheath and skin edge are brought

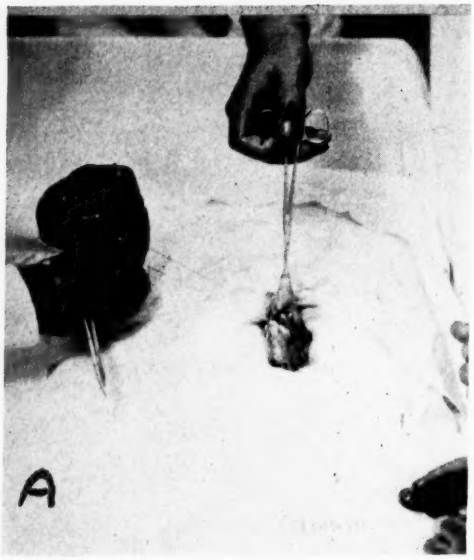


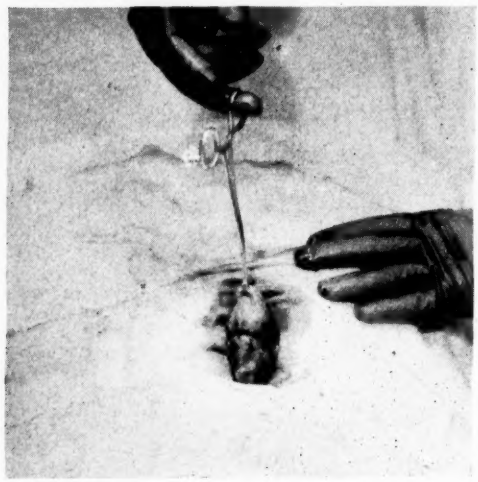
Fig. 4

down as low to the base as possible and sutured with interrupted silk (figs. 6 and 7). An opening into the apex of the tube (fig. 8) by means of a cautery may be made at any time from the first to the tenth day after the completion of the operation (fig. 9). It has been found more desirable to delay this opening until the seventh to the tenth day if possible, to allow healing of the anterior wall around the tube without infection (fig. 8).

SUMMARY

1. More responsibility must be assumed by the clinician who is first consulted by a patient complaining of lack of appetite and loss of energy and who has a mild anemia. The physician should be keenly aware of the danger of symptomatic treatment for these patients as it might mask the early symptoms of carcinoma. He should urge roentgen examination of the stomach. This is the only way in which an earlier diagnosis of gastric carcinoma may be made. Perhaps it is not too farfetched to suggest to all patients over 40 or 45 years of age the safety of a routine gastric X-ray every six months, or at least every year, as a possible means of early detection of carcinoma of the stomach.

2. Proper preparation of patients for surgery by correction of physiochemical abnormalities together with adequate



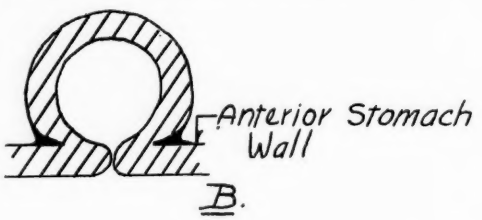


Fig. 5

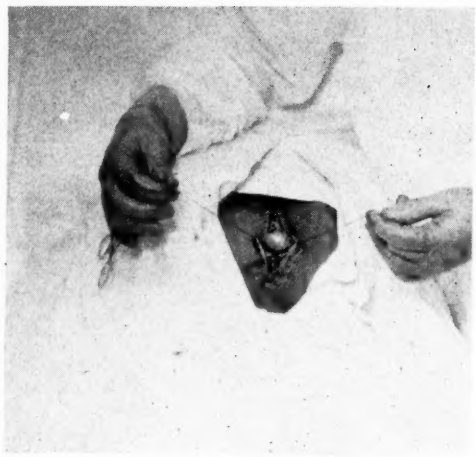


Fig. 6

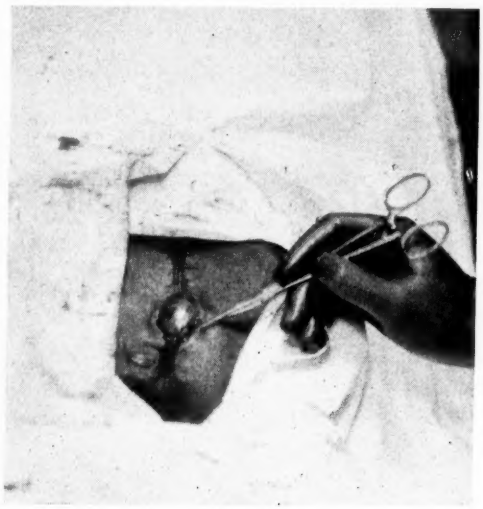


Fig. 7

postoperative care, is more essential to good results than brilliant operative technic on poorly prepared patients.

3. Whether palpable lymph nodes are present or not, the four zones of lymphatic metastasis should be included within the resection, to increase the likelihood of cure.

RÉSUMÉ

Le clinicien doit endosser plus de responsabilité quand il est consulté pour la première fois par un malade qui se plaint de mangue d'appétit, de perte

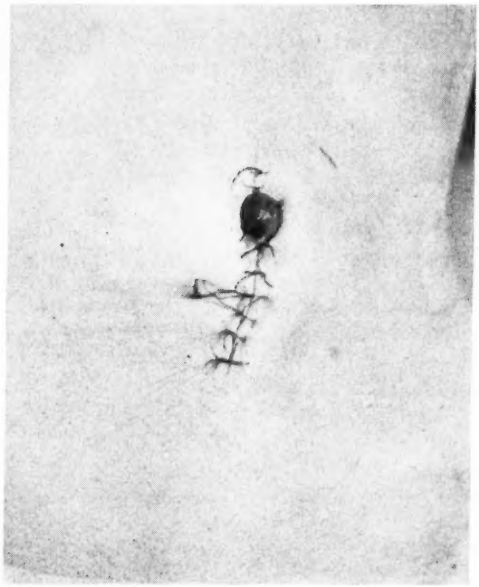


Fig. 8

d'énergie et d'anémie légère. Le traitement symptomatique de ces malasis apparemment bénens peut masquer les prémiers signes d'un carcinome de l'estomac. Il faut insister sur un examen aux rayons X, car de mayen est le seul qui nous permet un diagnostique précoce de carcinome gastrique.

L'auteur recommande aux malades de plus de 40 ou 45 cas de se soumettre à un examen radiologique de l'estomac chaque six mois, sinon chaque année afin de déterminer la présence ou l'absence d'un cancer de l'estomac.

La préparation appropriée du malade pour l'intervention chirurgicale et des soins post-opératoires adéquats

sont essentiels pour l'obtention de bons résultats. Qu'il y est ou non des nodes lymphaques palpables, les quatre zones de metastases lymphatiques seront incluses dans la résection afin d'augmenter la probabilité d'une guérison.

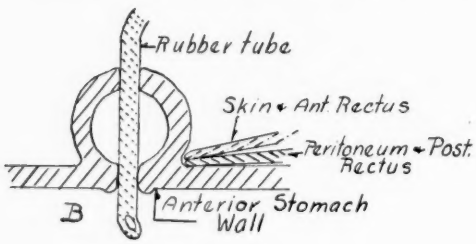


Fig. 9

RESUMEN

El autor pone de relieve la gran responsabilidad que cabe al clínico que es consultado por un paciente que aqueja falta de apetito, pérdida de energía y presenta una ligera anemia. El médico debe estar en guardia en estos casos frente a la posible presencia de carcinoma gástrico y en consecuencia debe eludir el tratamiento sintomático simple, ya que ello podria enmascarar los síntomas precoces de dicha grave lesión del estómago. Atendiendo a esta posibilidad, es conveniente que el práctico recomiende la exploración roentgenográfica, por ser éste el unico método para poner de manifiesto precozmente el carcinoma.

El autor estima que no sería exageración el proceder a un examen radioscopico en todos los pacientes que se observe por encima de 40 o 45 años de edad, tomando radiógrafías cada seis meses o por lo menos cado año, como una posible técnica para descubrir en su iniciación el carcinoma gástrico.

Una preparación adecuada del paciente mediante la corrección de las anormalidades físico-químicas, conjuntamente con la buena instauración de pertinentes medidas postoperatorias, es mucho más importante y esencial para los buenos resultados que una brillante técnica operatoria en un paciente pobremente preparado. Finalmente se recomienda la extirpación total de los ganglios linfáticos de las cuatro zonas de metástasis linfáticas, se observen o no nódulos palpables, ya que haciéndolo así se acrecientan las probabilidades de cura.

Свод.

Больше ответственности должно быть принято врачем, чей больной первый раз приходит с жалобами на потерю аппетита и энергии и у которого констатирована небольшая анемия. Врач должен сознавать опасность симптоматического лечения больных с этими, повидимому, простыми симптомами, так как они могут маскировать ранний рак желудка. Он должен настаивать на рэнтгеновском исследовании, так как оно является единственным способом постановки раннего диагноза желудочного рака.

(Continued on page 360)

Editorials

To Read, to Weep and to Ponder

OF all the atrocities of World War II, none were as contemptible as the actions and attitudes of some of the German medical and surgical profession under Hitler and his Reich.

In *The Knickerbocker Weekly, The Netherlands Magazine,** Dr. Karel Sperber, formerly of Prague, Czechoslovakia, and now of Vancouver, British Columbia, Canada, gives details of his experiences as a prisoner of war. Dr. Sperber came to know a number of prison camps, the last being the notorious concentration camp of Oswiečim. With commendable restraint Dr. Sperber limits his story to his experiences as a doctor, having been one among many imprisoned physicians forced to exercise his medical skill. The horrors of Oswiečim have already been widely publicized. Of the doctors' side less is known. Excerpts from Dr. Sperber's article follow:

As a medical student I had heard German professors say to their students, "Let this be your guiding principle: *Nil Nocere*—never harm your patient." I also remember Herman Nothnagel's words, "Only a Good Man can be a Good Physician" hung as a large sign upon the wall of one of our classrooms.

A good many of the concentration camp doctors must have seen these words in their student days; perhaps even SS Standartenfuehrer Dr. Lolling, Medical Officer in charge of all concentration camps. He arrived in Oswiečim one day in April, 1945, and informed us prisoner-doctors, for there were hundreds of us, that he was going to establish on a large scale experimental physiological-pathological experiments in which the universities of Heidelberg, Munich, Berlin and Koenigsberg would participate. In preparation we prisoner-doctors were forced to the manual labor of cleaning a barracks for the purpose. Five female nurses arrived and after them Dr. Clauberg, Professor at Koenigsberg University and Director of the Gynecological Clinic at Koenigshütte, Silesia. His assistant was SS Hauptsturmführer Dr. Wirths, chief medical officer of Oswiečim, and former regimental surgeon of Hitler's Leibstandarte.

Are these men on the list of war criminals? Have they been apprehended?

The first "patients" were women from Holland, mostly Jewish. They ranged in age from barely seventeen to over sixty. Some were pregnant. SS women equipped with the customary whips, pistols and bloodhounds, drove them into the experimental barracks. SS Hauptsturmführer Schwartz, a former groom, gave the orders. He was accompanied by a few very young men.

The women were forcibly stripped of clothing, while the SS men maltreated them. Then they were shaved, heads and bodies, by the five nurses. We doctors to whom under normal circumstances a naked body is no embarrassment, were deeply disturbed by these living hairless "dummies." We had to spread a greasy delousing cream over the poor bodies of Professor Clauberg's experimental material, bodies belonging to screaming shattered women: they might have been our mothers and sisters. Finally they were allowed to cover themselves with old Russian uniforms with colored handkerchiefs for their greasy bald heads. We then had to collect the hair from the floor and box it. It was worked into mattresses and the good "Bürgers" of the Reich who, as we have been told recently, never knew what went on in the concentration camps, slept on them with undisturbed consciences.

Taking no part in these preliminaries, Professor Clauberg buried himself with typical

* October 15, 1945, page 11.

German thoroughness in the preparation for his experiments, selecting assistants, installing apparatus, arranging for the collection of semen at the adjoining camp Birkenau.

By now the women were half crazed. Some were used for artificial insemination. Others were sterilized by x-rays and the ovaries then extirpated by an abdominal operation for microscopic examination. At the same time, Dr. Kaufman, a twenty-nine-year-old Herr Oberleutnant der Luftwaffe, carried out the same procedure on male prisoners, first exposing the testicles to sterilizing doses of x-rays, and then removing them for examination. To check the possibility of survival of sexual urges the Herr Professor and the Herr Oberleutnant paired off nude castrated men and women in tiny rooms and spied on their behavior.

In the teaching schools of the free peoples of the world films have been made of the birth process for the purpose of training midwives and medical students, mother and child being left unimpaired in health. At Oswiečim, too, confinement was photographed by Dr. Entres, the medical superintendent of the concentration camp, and his assistant, Dr. Mengele. But mother and child were then destroyed in gas chambers. Why feed useless mouths?

Cancer also engaged the scientific curiosity of Professor Clauberg. By a skillful operation he incised the wombs of healthy young women and implanted cancer tissue. Then he waited with the patience for which German scientists are noted, before finally removing the entire uterus for examination.

When the experimental work grew too extensive for his own staff Dr. Clauberg forced prisoner-physicians into the work. A Jewish-German Professor from Frankfurt, Dr. Salomon, who in better times had brought many babies, including future SS men, into the world was one. A woman doctor, Dora Klein, a former medical officer of the International Brigade in Spain, was another. Dr. Dering, a Polish physician from Warsaw, became so infected with the scientific poison that he turned renegade and was rewarded by being released and appointed assistant in Professor Clauberg's private clinic.

So far as I know the findings of the Oswiečim experiments have never been published. Their secrets are still with Professor Clauberg but I have been assured on good authority that little could have been revealed that has not already been proved by animal experiment. I do know, however, that after the subjects had served their purpose they were blessed with the mercy of a quick death by cyanide gas in the gas chambers of Birkenau.

Nothnagel said, "Only a good man can be a good physician." Though it does not necessarily follow that all doctors are good men, there have been enough of them to engage the faith and confidence of millions of sick and ailing who turn to them for help. But Nazi Germany has prostituted the finest arts and sciences and debased medicine. There is a tradition that doctors do not readily let each other down. But God forbid that as the concentration camps fade into oblivion and doctors the world over meet again to exchange ideas and discoveries at international conferences, any physician or surgeon should say of the German doctors of the German concentration camps, "After all, these men are scientists, men like us, and we must sit next to them and exchange ideas with them if medical science is not to suffer or perish."

To those who forgive and forget too quickly I dedicate these lines.

The *South African Medical Journal*, May 27, 1945, quotes from a communication received from Dr. Philipchuk, Secretary of the Soviet Scientists' Anti-Fascist Committee, Moscow, May 1944:

In violation of all international agreements the Germans are destroying civil and military hospitals and murdering and poisoning prisoners of war, burning down hospital buildings together with patients in them and deliberately spreading typhus.

Not only are German doctors participating in the planned extermination of the population of occupied territories as organized by the German High Command, but we also have ample evidence of atrocities perpetrated by German doctors on their own initiative. Here are a few facts:

Dr. Tuemer, head of the Public Health Department in Artemovsk in the Donetz Basin, forbade the townspeople to send food to prisoners of war who were dying of starvation in his hospital. He and his underlings murdered Drs. Klaudia and Sarah Shapiro and other medical officers, plundered local medical institutions and ordered the following to be blown up in retreat: Workers' clinics, the First and Second City Hospitals, venereal disease treatment center and stations, sanitary service stations, medical school, the Children's Hospital, the Children's Tuberculosis Sanitorium, ten nursery schools and infants' homes.

In Stalino in the Ukraine German Drs. Roll and Kuchendorf took part in the plundering and destruction of all medical schools and research institutions. Similar actions were carried out in other cities. The actions of these doctors everywhere made them worse than wild beasts. On the evidence given by Russian doctors who had been prisoners of war the Germans deliberately killed camp prisoners and held food at starvation levels. When released, the prisoners were completely exhausted and easy victims of typhus, dysentery and other infections rife in the camp. Russian doctors were executed in countless numbers. The notorious German Dr. Orland ordered filth from the latrines to be emptied into the pit dug by prisoners and then ordered them driven into the pit and there shot. This same Orland beat Dr. Bulochnick, broke his arms, gouged out his eyes with a gun and broke his pelvis, thereafter ordering Bulochnick and fourteen other doctors shot in the presence of prisoners of war, flanked by his fellow German doctors, Schulke and Brueck. There is documentary evidence that many Soviet, including Jewish, doctors were included in the mass shootings.

German doctors made it a practice to secure blood by forcibly bleeding children and adolescents. There is documentary evidence that in one village forty children below the age of thirteen were removed to the German army hospital at Starotitarovskaya where they were drained of blood. All died.

Soviet citizens were used in experiments by German doctors, to try out medications and operations, and given the complete bag of tricks from laboratory tests to photography during the experiment.

In view of these and many similar facts concerning the crimes committed by men with medical diplomas Soviet doctors can no longer maintain silence. They call on their colleagues of all United Nations to place a brand of shame on German army doctors who have converted medical practices into weapons for the destruction of life. We beg all our colleagues not to let the doctors of Hitler's army think their diplomas will save them from the inevitable retribution or that they will not be made to answer for their crimes together with other Hitlerite criminals.

From a Fellow of the International College of Surgeons now in Europe:

The systematic sacrificing of millions of innocent human beings would have been impossible without the support of the German medical profession. The world outside Germany, and particularly outside Europe, has been informed of but few details, yet few as they are they justify early institution of a thorough investigation.

The methods of dealing death, from the gas chambers in "death camps" to the intravenous injection of air would have been impossible without the scientific research of unscrupulous physicians who thereby supplied the tools of execution. Even the lethal dose of cyanide, later used for self-destruction by Himmler, von Friedeburg and others, was determined by experiments on Russian prisoners of war. Even the up-to-date mortuaries attached to the extermination camps served the doctors who studied the effect of the various methods of execution.

The moral and actual complicity in crime of some of the medical profession in Germany can be established, and incriminating evidence can be collected on the spot.

Further, not only were the majority of German physicians Nazi sympathizers but for reasons involving their career they even placed their services at the disposal of the Nazis.

In contrast, other high-ranking surgeons resigned from their posts and retired to private life or practice: Professor Voelcker of Halle and Professor Ranzi of Vienna were

among these. Professor Thierry de Martel of Paris committed suicide when the Germans entered Paris rather than lend his skill to the conquerors.

There is no doubt that the International College of Surgeons has to face its special duties and do something to forestall forever such occurrences by men holding themselves out as members of our profession.

Now you have read, and perhaps wept at heart or actually shed a tear or two, and now it is time to ponder.

As shown, some of the medical profession in German-controlled territory (and to call it "German" is equivalent to terming it "Nazi" for the two were — and are — synonymous and interchangeable) respected the Hippocratic Oath and remained loyal to its precepts.

This rather small coterie, however, seems but chaff in the gale of pestilence and plague that blew from the Führer's heights in Berchtesgaden, contaminating like the Black Death every disciple of Aesculapius it so much as passed by.

Even before these communications reached the editorial desk of this journal, revelations made by press, radio and personal communication had decided some of us that in this resumption of international scientific relations with European countries, Nazidom must be sifted thoroughly to separate the guilty from the relatively nonguilty. Any defense that the medical and surgical profession in Reich territory would attempt to make, in view of existing incriminating truths, would be only a pitiful begging of the question. As blood-crazed as were the jackals who were their masters through disseminated knowledge, the refinements of Nazi insults and depravities performed upon human bodies and human minds attained a perverted cruelty of bloodlust that bygone Chaldea and ancient Africa and even the pits of Hell must envy!

These refinements of insult and depravity performed upon human bodies and minds were products of the Nazi scientific mind. The German has always had a marvelously ingenious and scientific mind, fortified by his passion for meticulous detail. Having become, by Hitler decree, a superman, with no restraining influence upon him since he was lord of all he surveyed, the German Nazi found no reason why he should wear a bridle or even a halter, and accordingly let himself go. The peasant expressed himself by such tricks as peeking into latrines and watching captive women heed the call of Nature, or by rough and brutal rape, or by desecration of churches and clean homes—and even human beings—by excrement. Those on higher social levels wanted their bestiality done up in silk, calling on their magicians—the scientists—to find new ways to pull rabbits out of a hat, for, weakened by their own perverted appetites and crimes against nature, a potent spur was needed.

Not a single man who had ever taken the Oath of Hippocrates can find a scintilla of excuse for connivance with Nazi perversion and sadism, but it is to be expected that, by lies and evasions and trickery, the surgeons who flaunted the Nazi gonfalon will attempt to effect restoration to the ranks of the ethical and clean.

Let it be firmly agreed upon, then, that when surgeons from every land finally can come to the conference table for an interchange of experience and of knowledge, there shall be no taint of what Homer spoke of as "swine about the board." There must be no place at that table now or in years to come for those guilty of such bestial crimes against our profession and against humanity.

We must be just, but it is well to remind ourselves that, for men of our

profession especially, justice is not enough. It is not enough to bar our doors against the doers of this evil. In the rise and spread of the evil epidemic of Nazism is the old, old challenge to the healers of the world. How shall we restore the sick? How shall we strike at the roots of the evil so that the plague shall never again sweep the earth?

For those ravaged by the disease, including men of our own profession who have gone down to disgrace and dishonor under its attack, there may be little we can do. Probably we shall have to recognize their madness as akin to other mental aberrations of similar violence and perverseness. We can and we should try the best of modern methods to effect their isolation and their reeducation. But we shall recognize sadly that the possibilities of restoring most of them to the full and effective use of their capacities is indeed small. The disease which has had them in its grip has left its indelible mark upon them. The hard fact which every doctor faces again and again—that "forgiveness of sin" does not mean sin's erasure—confronts us here in a new and terrible form.

The hope—and the great challenge—lies beyond the lives of those one-time brothers of ours, beyond our own lifetime. We must begin now to learn to protect our profession and the world it serves against a recurrence ever again of this devastating sickness. Our sole therapeutic armamentarium consists of exposure, ostracism, reeducation of those not hopelessly contaminated by the Nazi virus.

Psychologists and pathologists alike have new responsibilities laid upon them. Medical research must turn to the examination of the disease, must bend every resource to discovering and isolating and destroying its virus. We must know the early symptoms warning of its approach. We must find the means which will check its advance. We owe this to ourselves, to the honor of our profession, and to mankind.

We shall find, I am sure, even before our researches have gone very far, that this great madness, this dread disease, is not unlike other diseases the flesh is heir to in that it gains access to the human mind and body at points already weakened. And here is the greatest, most universal challenge of all. Could the wholesale corruption of German medical men have happened if there had been no chinks in the armor of their professional ideals and ethics? The same kind of chinks which we are all too prone to overlook in our fellow medical men—and especially in ourselves. Through the horror and disgust filling our minds as we read the record comes a disquieting still small voice: There, but for the grace of God, *go you yourself*. That voice should be heeded now, by every one of us. The great vows of our profession should be renewed in our hearts.

We serve a high calling, one which lifts the greatest majority of us, far beyond the cheap and petty things of life. But, shameful though it is, we must remember that even here, in this, the most truly free land on earth, there are a few, even among our own—even among those whose blood and heritage are above reproach—who would deny equality to their fellows; those who—in some instances, precisely *because* of such blood and heritage—feel that they belong to a world apart, a sphere a little better than the common run. So much the worse—for, in such reaching after a social isolationism which our founding fathers sought in their wisdom to abolish, they are propagating and perpetuating a myth of spiritual superi-

ority, which in its way, is quite as evil, and far more insidious, than the festering Nazi viciousness.

These self-styled "supermen"—upon whatever their claims to such superiority may be founded—are actually seeking, no matter how steadfastly they may deny, even to their own hearts, such an intent, by slower and more devious means, to effect a degradation of men's minds, which, in its end results, could do quite as much harm as the poisonous Nazi ideologies.

Yes, truly we do serve a high calling. Its standards of ethics and of humanity are not be trifled with. The Nazi doctor, his hands red with blood, has taught us that.

Finally, let us be ever conscious of those with whom we associate, with whom we break bread and whom we recognize as civilized men and colleagues. "Show me the man you honor," said Carlyle, "and I will know what kind of a man you are, for it shows me what your ideal of manhood is, and what kind of a man you long to be."

MAX THOREK.

NOTICE

Fellows of the International College of Surgeons and their wives, attending the American Medical Association meet at San Francisco, are invited to a luncheon and drive through the countryside to St. Gothard's Tavern in St. Helena, Napa County, California, on July 4th at 12 o'clock. Transportation will be furnished by the San Francisco and Los Angeles Guilds of the International College of Surgeons. For details, address: Dr. Felix Cunha, 450 Sutter Avenue, San Francisco, California.

(Continued from page 354)

Автор не считает преувеличением подвержение всех больных 40-45 лет рэнтгенографии желудка каждые шесть месяцев или, по крайней мере, каждый год, как единственный способ раннего открытия рака желудка.

Для хорошего результата правильная подготовка больного при помощи коррекции физиохимических ненормальностей вместе с адекватным послеоперативным уходом — являются более существенным, чем блестящая оперативная техника над плохо подготовленным больным. Чтобы увеличить возможность полного излечения, все четыре зоны лимфатического метастаза должны быть резекцированы, несмотря на отсутствие осязательных лимофатических желез.

Mexico and the Latin Americas

WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., M.D., C.M., F.I.C.S.
NEW YORK CITY

REAL inter-American friendship had its inception not so much through trade or politics or diplomacy, as through sanitation, manifested by the accomplishments of the Panamerican Sanitary Bureau and other agencies, preceded by the great work of Gen. Gorgas and others. By sanitation, we mean all that concerns the life and health of the individual, the community, or the nation. We Americans of the north, more favored than our brothers in the other Americas along many lines, extended to them a helping hand which was grasped by them in a coöperative spirit. Our twenty-one republics have proved that there can be successful unity of effort without organic union. Despite differences in creed, color, race and language, we are something of a benevolent association, and in the spirit of "give and take," may be an example that nations can work together in harmony and peace. As the president of one of our neighboring republics said to me, "We need you and you need us, for the long pull ahead." *How true this is!*

We must bear in mind that the other Americas, particularly Mexico and Central America, have sections where there is a tropical or semitropical climate, with jungles, inaccessible mountains, vast areas of desert land wholly lacking water. The main bulk of the population is poor; there exist illiteracy, fanaticism and disease. Yet you will also find beauty there. Those of us who long for the Alpine peaks of Switzerland, the glaciers of the Engadine, the charm of the Dolomites, the lakes of Italy or of England, the beaches of the Riviera, the boulevards of Paris, the archeological museums of London or Cairo, will find that all of these have their counterparts below the Rio Grande. If you are looking for great Universities and centers of learning, you will find these also.

Good neighborliness may bring repercussions from the medical, surgical and sanitary standpoints, for if there is much travel back and forth, certain transplanted diseases, modified perhaps by changes in climate, nutrition, conditions of living and individual resistance, will have to be combatted. This of course, is a point that will require more attention as our fighting men come home from far-off lands, or disease ridden islands.

Although the primary cause of much of the regional disease of the other Americas is the lack of sanitary conditions, the majority of Indians living by themselves whom I examined, had for example, splendid teeth and healthy gums. The sunlight in which they live, the limes and limewater they use in their cooking, the oranges, avocadoes, mangoes, bananas, etc., which they seem always to be eating, their use of whole grain, save them from certain deficiency diseases with which we, less primitive in our living, are all too familiar as are those Indians who, residing nearer cosmopolitan centers, partake of more refined foods.

Certain Indians of the middle Americas, so I was informed when I visited these lands on a government mission,

Read at Banquet Meeting of Tennessee Division, U. S. Chapter, International College of Surgeons, Knoxville, Tenn., June 8, 1945.

in order to avoid or cure anemia, punch rusty nails into apples, then eat the apples to get the benefit of the iron.

It is an interesting not commonly-known fact, that the Dominican Republic had a hospital before 1503 and a School of Medicine in its University which was founded in 1538. Puerto Rico founded her first hospital around 1511, Panama about 1521. In Mexico City there exists the oldest functioning hospital in all the Americas, with modern equipment and methods, which was founded by Cortes in 1524. Also in Mexico, a chair of medicine came into being in 1580, as well as what was probably the first college for women *anywhere* in the world, in 1537. The oldest university on this hemisphere which is still functioning, is situated in Lima, Peru. This was founded in 1551.

I give you these dates not to bore you with numbers but with the thought that a little humility is good for the soul! In fact, one of our great radio commentators, Raymond Swing, has said that "to be brothers of the Latin Americans we in the north will need to wear the garments of humility, for the culture of the cultured in that part of the world is superior to our own." We hear much of the backwardness of some of these countries, but the progress that they have made to date in spite of almost insurmountable handicaps, challenges our admiration!

Many of our remedies of today are derived from the Aztec pharmacopias. The diet of pregnant Aztec women was very carefully regulated. Both the Mayans and Aztecs stressed the importance of the physical training of children. Vaccination against smallpox began to be practiced in Guatemala only eight years after Jenner introduced it in England. In the malaria ridden Islands where our men fought and died, battles were lost for the lack of quinine. It is of interest to realize that this drug was first used by the Latin American Indians.

Perhaps you will be interested in a few observations that struck me as outstanding in some of the countries among the twenty to which my mission took me. I will not bore you with many.

In Guatemala, there is a Municipal General Hospital of 1400 beds. I learned that they cure or readjust about 40 per cent of their mental cases.

The treatment of the mentally sick in Costa Rica is very advanced. This is one of the problems so vastly accentuated by the war which we are having to face as our men are sent home. At the time of my visit, they had 700 such patients in the institution of whom they readjust 30 to 40 per cent. When a mentally sick patient enters the hospital, he is given an hypnotic and in two or three days is permitted slowly to come from under the drug. He is then put to work with the other inmates. The institution is clean and cheerful with many flowers about. There are no mechanical restraints and an atmosphere of freedom pervades the place, which I have never seen surpassed in any such hospital anywhere. They have ducks and chickens, all taken care of by the patients, who also make their own clothes. As one who has been Surgical Director of a large hospital for the mentally ill for many years, I was particularly impressed by this institution.

The Dominican Republic has in its Army hospital one of the best equipped, cleanest operating rooms that I saw south of our country. This little nation is waging a war against tuberculosis, venereal disease, leprosy and malaria. Every three months, motor cars are examined and a fine levied if each does not contain a first aid kit. Considering the number of motor vehicle accidents

we have in our own country, it might be wise for us to follow this example!

In many of the countries of Central and South America they are using good psychology in an attempt to avert motor accidents. In some places, as we neared a sharp turn in the road we found a mound of earth with the dilapidated ruin of a car on top of it. Here and there, high in the mountains along narrow winding roads, we came upon a small plot of ground with several crosses, showing the number of persons who had been killed on that particular spot.

In some parts of Mexico, in the rural districts there was one doctor for from 5 to 10,000 persons during the years 1932 and 1936. In those years in towns of 10,000 or more, 86.32 per cent died without any medical diagnosis whatever. In a remote region of the Yucatan nearly 77 per cent of the population never lived beyond fifteen years of age —just about the time when we are beginning to plan for the future of our children. The government realized that something had to be done. One of the solutions was to send senior medical students to communities where there were no doctors. This takes the place of internship. These men, living among primitive people, have to improvise their own clinics. Another solution is to take poor but promising young men from the rural districts and give them free medical training with the understanding that they must return to their rural sections for at least five years after graduation. These backward people, far removed from the cities, still believe in witchcraft, so progress is exceedingly slow.

The United States does not have a monopoly on so modern a device as air-conditioning. In the large hospital in Caracas, Venezuela, the operating room is air conditioned. When I was in Cuba I was very much interested to see a natural air conditioning system in use there. The cancer hospital in Havana is the only one in the tropics, so I was informed, that had been constructed with a plan in mind to secure the advantage of the winds which blow in one direction during the morning and in another in the afternoon—the hottest part of the day. The great Finlay's son, by the way, whom I met, is a professor at the University of Havana.

When calling on the Chilean Minister of War, I found him in the midst of translating our CCC (Civilian Conservation Corps) plan. He was preparing to introduce a bill to have this plan adopted for Chile.

Throughout the other Americas, I found that practically all instruments and equipment came from Germany. The first reason for this, I learned, was that our prices were prohibitive by contrast. The second reason was that our business men insisted on cash or thirty days' payment, whereas Germany allowed unlimited credit. Most of the best schools were German schools, and most of the English language texts were translations from the German. A European attitude of mind has been forced upon these people from youth up, because practically all books of education, of reference and research are Spanish translations from German or French. There is almost complete absence of anything from North America. For years, students, research workers and postgraduate students have been helped financially to go to Germany—certain ones fully financed—and given special opportunities. Some actually discussed openly whether it would be more advantageous to be a colony of the Reich or of the United States. In 1941, one or the other seemed inevitable. In Ecuador, all the literature

(Continued on page 364)

Following are summaries of an article by Hugo Picard, M.D., Cairo, Egypt, entitled "Treatment and Prevention of Thrombosis with Dicoumerol," which appeared in our March–April issue.

SUMMARY

After a thoughtful review of the many possible postoperative complications and hazards, such as shock, circulatory and metabolic disturbances and infections, the author mentions the work that has already been done toward lessening these difficulties. He then describes the accepted theories regarding the action of the antiprothrombic drug, dicoumerol, and describes both its therapeutic uses, and those as a treatment for embolic and thrombic conditions already existing. He then cites a number of widely dissimilar cases in his own experience in which this drug has been used successfully.

SOMMAIRE

Après avoir fait une revue très réfléchie de tous les hasards et des complications post-opératoires, tels que choc, troubles métaboliques et circulatoires, l'auteur mentionne ce qui a déjà été accompli pour diminuer ces difficultés. Il décrit les théories acceptées concernant l'action du dicoumerol et l'action thérapeutique et cet agent. Ce médicament peut assi être employé dans le traitement de conditions tels que embolisme et thrombose existants. Il rapporte un nombre de cas dissimilaires dans lesquel il eut recours au dicoumerol et obtint des résultats satisfaisants.

RESUMEN

Después de un cuidadoso estudio de las diversas posibles complicaciones postoperatorias, tales como shock, transtornos circulatorios y metabólicos e infecciones, el autor menciona los trabajos que ya se han realizado para disminuir dichas dificultades. Luego entra a describir las teorías aceptadas en relación con el medicamento antiprotrombósico, el dicoumerol, y detalla sus usos terapéuticos y su empleo en el tratamiento de los estados embólicos y cronicos preexistentes. Finalmente, relata algunos casos de índole ampliamente variable en los cuales usó personalmente la droga con resultados satisfactorios.

(Continued from page 363)

published by the official travel bureau was in German with the two opening pages written by the president of that country. Happily, all this is now being changed.

Quite apart from the activities at Chapultepec and San Francisco, I believe that the awakening of our country to the needs of the other twenty republics on this continent, and of their understanding of what they can contribute to the good of all in a practical way, will have far reaching results. We are allies in the whole-souled fight against the trinity of sickness, suffering and death; in that battle there can never be a slackening, come peace or war. The universality of the healing art for the cause of humanity is a real foundation for a better world of tomorrow. While it is true that there is a nobility of heredity and a nobility of possession, there is no greater nobility than that of service. We as medical men have been given the greatest privilege of all, that of serving mankind.

The Artificial Pupil in the Restoration of Vision

DONALD T. ATKINSON, M.D., Sc.D., F.A.C.S., F.I.C.S.
Fellow the Royal Academy of Medicine, Ireland
SAN ANTONIO, TEXAS

POSSIBLY there is no type of ophthalmic surgery so neglected as that indicated for the restoration of vision to sightless eyes resulting from corneal opacity or agglutinated pupil. This fact, no doubt, is due to the numerous failures in the past which have followed this kind of surgery in which the results often served to terminate the previously hopeful attitudes of the surgeon to such an extent that, in similar future cases, operation was not advised. Thus this type of surgery has fallen more or less into disuse. But, regardless of these unfortunate incidents, there are apt to be found annually in the practice of any busy ophthalmologist, a number of cases in which, by doing iridotomies or iridectomies, when a normal iris exists behind the cicatrical cornea in which a small transparent area remains, some degree of satisfactory vision may be obtained.

A recent American surgical textbook [1] gives a synopsis of a series of cases of blind eyes in which, by making artificial pupils, I was successful in restoring vision—not, however, by any original technic upon my part. Since these cases were first reported, I have performed several times this number of operations for similar conditions using practically the same methods. I have, also, in several instances created central pupillary openings in agglutinated irides of aphacic patients by a method which, so far as I know, is original with me, the technic of which I shall discuss farther on in this article.

Description of the cases alluded to above, first appeared in print in my book, "External Diseases of the Eye".[6] They were, with one exception, blind in both eyes but with one eye operable, the vision in the other having been lost as a result of accident or disease. These cases may be outlined as follows:

Case 1. The first was that of a hospital nun, 57 years of age. The left eye of this patient was normal. In the right eye, however, a dense central leucoma was present which obscured her vision except for light perception. An optical iridectomy, with the section made from nine to one, in what would correspond to a clock dial, though followed by a postoperative iritis, eventually resulted in restoration of vision in this eye to 20/30 minus one.

Case 2. The second case was that of a farmer 65 years old who lost his vision in the left eye at the age of 20. Four years before he visited me, he had been the subject of a central corneal ulceration of the right eye, the resulting scar tissue obscuring his vision since that time in this only seeing eye. In this case a new pupil in the right eye made through an incision from seven to eleven, resulted in useful vision. Since the operation the patient states that he has been able to attend to his duties on his farm in a normal manner.

Case 3. The third case was that of a young woman who had had ophthalmia neonatorum followed by frequent attacks of iritis in later years. In the right eye, she had a bulbous cornea with no vision. In the left eye, a partial leucoma existed. About one-half of the cornea was transparent, but the pupil was entirely closed by organized exudates. Some difficulty was encountered in engaging the iris with the knife during the performance of a Kuhnt's incision made from six to eleven of the clock dial. After doing this, I was able to grasp and snip off a portion of the iris. The lens was spontaneously delivered. Through the small pupil thus made,

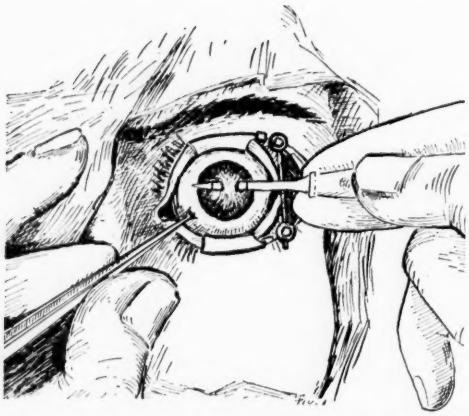


Fig. 1.—A Von Grafe knife, cutting edge downward, has been passed through the cornea at the temporal side at a point 4 m.m. from the limbus. It has further been carried through the iris adjacent to the sealed-over pupil and again has appeared in the interior chamber, after which its tip has been thrust through the cornea at the nasal side preparatory to making the section downward.

this patient, wearing her aphacic correction, acquired a degree of vision which enables her to do the housework for her family, to recognize her friends across the street and, as she states, "to thread a large darning needle."

Case 4. The fourth case was that of a 66 year old woman whose right eye had been lost during childhood as the result of accident. Ten years before being seen by me she had been operated upon for cataract in the left eye. The cortex left in the anterior chamber, together with an organized exudate of lymph which was due to a postoperative iritis, had since entirely occluded the pupil and obscured vision. Two operations for the relief of this condition had been done with no results. She was seen eight years after the last operation of this kind with only light perception remaining. By making a modified Kuhnt's section from ten to three of the clock dial and by drawing the obstructing iris into the wound and snipping it off a good pupil slightly above the center of the iris resulted. This patient obtained vision of 20/60 and with her correction for aphacia was able to read newspaper print.

It has been my observation that in cases similar to these, most gratifying results may be obtained by steps which may not seem conservative but by which, there being no useful vision, nothing is to be lost, with the possible exception of a sightless globe. While all cases requiring iris surgery are not so simple as the cases alluded to, they may be classified about as follows:

First, are those cases in which the pupil, due to a previous iritis, is adherent to the anterior capsule of the lens, this contingency obliterating the pupil by organized lymph.

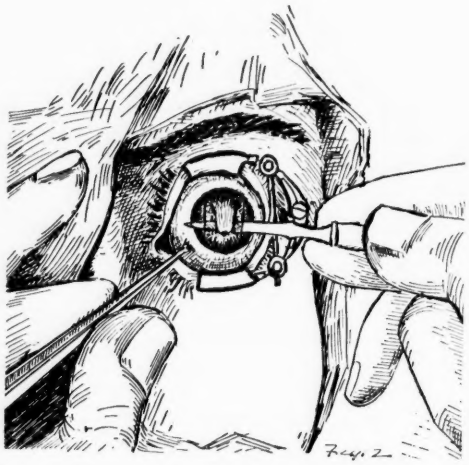


Fig. 2.—The knife, as seen in fig. 1, has been carried downward, the section embracing the cornea as well as the iris adjacent to and including the sealed-over pupil. The taut iris is about to give way before the cutting edge of the knife.

Second, are the cases resulting from injury, in which corneal wounds have incarcerated the iris, terminating in drawn-up and sealed-over pupils.

Third, are those due to central opacities of the cornea as end results of ulcerations, most of such cases being due to gonorrheal infection.

Fourth, are postoperative occlusions of the pupil occurring in cataract cases or in patients in which the cornea and iris had been incised for some reason, and in which exudates later formed in

the anterior chamber and there became organized.

Eyes of juvenile patients falling within the first classification may be benefited by a dicission of the lens preceded by an iridocapsulotomy. In such patients, absorption of the lens may be looked for after the capsule has been ruptured.

In the eye of an adult with an adherent iris and the pupil entirely occluded by being sealed over by exudates, it would be useless to expect vision from a central opening made in the iris, unless the crystalline lens were also extracted, as the capsule (necessarily interfered with) would immediately subject the lens to a cataractous process. With eyes of this character, the best results may be expected by making a section similar to that adapted to cases of uncomplicated cataract. The primary incision may be made with either a keratome or a Von Grafe knife carried downward into and through the iris below the pupil. The portion to be removed will then be elevated by means of a capsule forceps after which it may be snipped off with a small, thin-bladed scissors. The lens may then be removed in the usual manner. If properly done, this operation will leave rather a satisfactory central opening in the iris which will probably be accompanied by beneficial results.

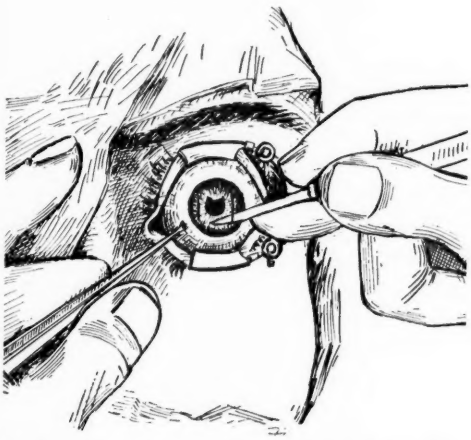


Fig. 3.—The corneal and iris section has been carried downward and the iris has been divided; the iris flap has retracted itself, thus leaving a satisfactory pupillary opening. The knife is being withdrawn.

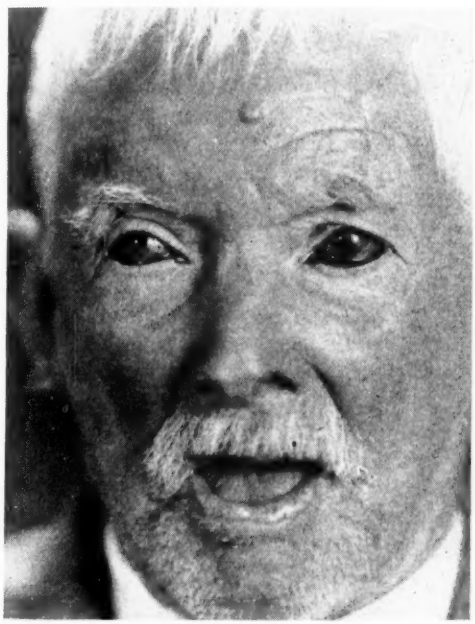


Fig. 4.—Aphacic patient, age 81, upon whom the first combined corneal section and iridotomy was performed. The operated eye regained vision of 20/40; the opposite eye was sightless.

Where the pupil is found to be closed by a prolapse of the iris into a corneal wound, as in the second type of cases, or into an opening in the cornea resulting from a perforating ulcer, it is comparatively easy to detach the iris from the cornea without creating an injury to the capsule of the lens. This may be accomplished through a much smaller corneal section than the one indicated for a cataract extraction. After the incision has been made in the cornea, an iris forceps grasps the attached portion

of the iris, after which it may be gently pulled through the corneal wound and excised. Usually this will leave an opening in the iris of sufficient size to promote vision and will be followed by good results.

The largest number of cases with which we will be confronted, will fall under type three of the preceding classification. It is in cases of this nature that we may expect our most gratifying results. A severe corneal inflammation may often occur without any untoward effect having befallen either the iris or the crystalline lens. The only indication which presents itself in an eye thus involved, providing a clear area of cornea remains, will be that of a simple iridectomy. In cases of opacity of the cornea obscuring the pupil, when a small portion only is sufficiently clear to permit of the admission of light, the section should be made slightly beyond the sclerocorneal margin. This is for the very evident reason that, should the section be made a millimeter or two inside the limbus, the resultant corneal haziness may so effect future vision that the object of the operation will be entirely defeated.

Kuhnt's operation for making a permanent opening through an iris which has been complicated by an agglutinated pupil, as in type four, is an easy procedure to carry out and one that will usually promise better results than when any other method is employed. In doing this type of operation, a Von Grafe knife may be carried through the cornea and made to perforate the iris. The knife is then thrust forward six or eight millimeters, after which the blade is elevated slightly and advanced, in order to make a counter puncture in the iris. The section in the cornea, including the iris, is now finished in the usual manner. An iris forceps grasps the iris; a portion of it may then be slightly withdrawn and snipped off. The section may be made downward if the clearest area in the cornea is in that direction.

For the fourth type of agglutinated pupil caused by the adhering of the iris to the lens capsule in aphacic patients, I have, on various occasions, obtained a large permanent pupil by a method which I believe to be original. The technic of the procedure which I have adopted, with certain variations required by each individual case, is as follows:

Let us presume that the operation is to be performed on the left eye. A Von Grafe knife, cutting edge downward, will be inserted through the cornea about four millimeters from the sclerocorneal margin and at a point corresponding to two on the dial of a clock. With the iris then engaged by the knife, the section, after the counterpuncture in the cornea is made, is slowly carried downward. Soon the taut iris gives way and gapes, due to its inherent elasticity; an artificial pupil is thus created. The iris will usually be cut through and will gape, before the corneal section, as it is carried downward, gets beyond points corresponding to four and eight of the clock dial. The knife is then withdrawn.

It should be remembered that an artificial pupil should be made as near to the center of the cornea as possible. The configuration of the normal cornea and the crystalline lens make this advisable. A new pupil at the periphery gives rise to "dazzling" vision. Therefore, what would correspond to areas between two and five or between ten and seven of the dial of the clock, and as near to the center of the cornea as possible, must be considered the most favorable locations for the formation of a coloboma for visional purposes.

An iridectomy should not be performed in the absence of sufficient light perception. If an area of clear cornea exists, and if the iris beneath this trans-

parent portion is normal in luster and is not adherent to the cornea, the case may be considered favorable for surgical interference. Then, if the patient can distinguish the shadows of the hand when it is passed between the eye and a light, one should feel quite confident that an iridectomy for optical purposes would be likely to lead to good results.

CONCLUSION

(1) There is no type of eye surgery so neglected as that for the restoration of vision, in cases of sealed-over irides or of central scarring of the cornea. This is due to the frequent disappointments following surgical interventions upon cases of this type, particularly in instances in which the lens capsule and the iris were adherent over large areas.

(2) As a result of operations done with a minimum amount of risk, comfortable vision may often be brought to patients whose visual usefulness had long been lost.

(3) Sites for operations, with a view to creating colobomas for visual purposes, should be selected, when possible near the center of the iris rather than at the periphery to prevent the "dazzling" which sometimes occurs where peripheral colobomas are made. In adult patients with iridolenticular adhesions, the lens should be extracted; otherwise cataracts will immediately follow the operation. In children, where iridotomies are done, a dicission of the lens only, is indicated as rapid absorption of lens tissue will follow.

(4) In cases of central corneal opacities, behind which are normal irides, an iridectomy of the classical type is a simple performance which nearly always results in great improvement in vision.

(5) I have been the originator of a simplified method for creating central openings in the iris in aphacic cases in which the iris had been sealed over by exudates. This consists of a corneal section in which the knife, cutting edge downward, is made to penetrate the cornea 4 mm. from the limbus, after which it is forced through the iris and passed 6 mm. forward where it again enters the anterior chamber, after which the counter puncture in the cornea is made at a location similar to that of the initial puncture. The ensuing section is not to be finished, as the elasticity of the iris will cause a coloboma to occur before the section reaches more than a few millimeters downward. The knife is then withdrawn from the unfinished section. The artificial pupil thus made will be near the center of the iris, a location which is most favorable.

SUMMARY

The author cites earlier failures in attempts at the construction of an artificial pupil, as the probable reason for the present neglect of this important procedure. He mentions several series of his own cases, which have been successfully operated upon, and gives a simple description of two operations, one his own technic, for restoring at least partial vision to those who have lost all except light perception through injury, iritis or other causes. He reports three cases.

SOMMAIRE

L'auteur nous cite les insuccès qui dans le passe ête la construction d'une prunelle artificielle furent fréquents. Il rapporte plusieurs séries de ces cas personnels opérés avec succès. Il nous donne une description de deux techniques opératoires, une de ces techniques est la sienne, qui rétablissent une perception partielle de la vieu chez ceux qui ont perdu toute perception de la

(Continued on page 388)

Ligation Treatment for Varicose Veins

An Estimate of the Present Status of This Method

ELIAS D. LAWRENCE, M.D., F.A.C.S., F.I.C.S.
PATERSON, NEW JERSEY

As we review the literature on the treatment of varicose veins, we find that progress has been made as the knowledge of the pathological anatomy and physiology of the venous system of the lower extremity became better known and suitable sclerosing solutions developed. The results of treatment, either by surgery, or injection, never were satisfactory. It was not until 1930, when de Takats described ambulatory ligation at the saphenofemoral junction, combined with retrograde injection, that an effective method of treatment was first described in this country. Much progress has been made since that time.

Failures in the treatment have resulted either from lack of knowledge of the pathology present or inability to determine before operation the requirements in each individual case. The literature is full of descriptive anatomy of the venous system of the lower extremities, but this is cadaver dissection, not dissection of living legs with distorted, dilated veins, destroyed valves and reflux of blood through incompetent perforating branches. It is good to know that there are usually 3 main veins emptying into the saphenous near its femoral junction, and that these must be tied and cut—but it is more important to realize that a reflux from the deep system of veins may occur at the midthigh, the knee or lower, and that each of these must be located before operation, ligated and cut, if you are to get good results with the operation.

The veins of the lower extremity are arranged in three sets, superficial, communicating and deep. All are protected by valves the purpose of which is to maintain the venous return in one direction, i.e., from below upwards. In varicose veins, this normal flow of blood is reversed and is from above downwards. This is caused by absent or incompetent valves in either the superficial, the communicating or the deep veins. From postmortem study, it is known that in 25 per cent of legs dissected, there is a congenital absence of the valve at the saphenofemoral junction, thus predisposing to the development of varicose veins. Other causes are the lack of supporting tissue in the veins, thrombophlebitis or congenital weakness of the valves, made incompetent by increased venous pressure as in hard physical work, increased intraabdominal pressure or pregnancy. The lesser saphenous vein is reinforced with a firm band of fascia at its junction with the popliteal —apparently the reason it is so seldom necessary to ligate this vein. Incompetent perforating branches are the most important causes of failure in the treatment. The common sites are just above or just below the knee, and above the ankle, but they may occur anywhere. The arrangement of the venous pattern is so variable, that no two legs are the same. Each case must be studied individually, and the pathology present determined and evaluated by certain definite tests that have already been developed and described.

The Trendelenberg, the first of these tests, was described in 1891; it is still one of the most important. It is a demonstration of reversed venous flow and also of the competency of the valves of the communicating veins. With the patient on his back, the affected leg is elevated to empty the veins. Pressure is then made with the fingers to occlude the terminal saphenous (the location having been previously determined), and the patient asked to stand. If the veins below do not fill within 30 seconds we consider that there is no reflux from the deep circulation, and that competent valves are present. The pressure on the saphenous is now removed; if there is rapid filling of the veins, there exists a reflux of blood due to the absence or incompetency of the protecting valve at the sapheno-femoral junction. Such cases are said to be "Trendelenberg positive." If no reflux occurs, the case is "Trendelenberg negative." If there is rapid filling of the veins from below on standing, with further distension of the veins with removal of the pressure above, the case is "Trendelenberg double positive."

The Perthes' test is a test of the deep circulation. Ligation or injection of dilated varicose veins in the presence of deep thrombosis and incompetent deep circulation will aggravate the existing pathological condition, since, in these cases, the dilated veins represent a collateral venous circulation that must be maintained. The test is performed by elevating the leg to empty the veins, and applying a three inch rubber or elastic bandage from the toes to above the knee. The patient then walks for about thirty minutes. Aching calf pain and cramps in the foot and calf indicate an insufficiency of the deep circulation—an indication of "Perthes' positive"—and only supportive measures are to be used in treatment. Another application of this test is to stand the patient so that his veins fill up, then apply a tourniquet at the groin. The patient now walks back and forth. If the veins empty or become considerably softer, the test is "Perthes' negative," an indication that the deep circulation and its valves are functioning properly. The direction of blood flow is from the dilated veins, through the communicating veins to the deep veins. If, on releasing the tourniquet, the veins fill rapidly from above, there exists a reflux at the saphenofemoral junction—another indication of "Trendelenberg positive." If, however, after walking with the tourniquet in place, the veins become more prominent and more tense, it means that there is a reflux from the deep veins due to incompetent valves or a deep seated thrombosis. This latter condition must then be ruled out by the method described above.

The Mahorner-Ochsner Test is a modification of the Perthes' Test. It has the advantage of showing at what levels the incompetency of the communicating valves exists, by applying the tourniquet at successively lower levels of the thigh and having the patient walk, observing the size of the varicosities at each level. I use the same principle, except that I apply the tourniquet below the knee first, and have the patient walk. If the veins empty, you can be reasonably sure that no reflux is occurring below that point. The tourniquet is then applied at successively higher points. In this way the lowest point of reflux, if any, can be determined and marked. Another way of corroborating these findings is by the Multiple Tourniquet Test, in which the patient lies down, elevates the affected leg to empty the veins, after which tourniquets are applied below the knee, above the knee, at the mid-thigh and at the upper thigh. On standing, the lowest tourniquet is removed first, the veins being observed for amount of

filling, as each tourniquet is removed. It may be necessary to reapply two tourniquets at various levels to check exact location of each perforator.

Adams described the Coughing Impulse Test, based on the observation that on increasing the venous pressure by coughing, a thrill or vibration is felt over the saphenofemoral junction when the valve is incompetent. He felt that, at times, the saphenous valve might be competent to standing pressures and give a negative Trendelenberg, but with the added strain of a cough, reflux would occur in borderline cases. This gives very valuable information. Where positive, the exact location of the terminal saphenous is quickly determined, especially in obese patients; also its condition, i.e., thickened, dilated or thinned out. By sliding the palpating fingers down the vein and having the patient cough, the presence of the venous thrill may be located at various points along its course. By applying pressure over the terminal saphenous and repeating the cough, the disappearance of the thrill below signifies that the reflux at the saphenofemoral junction is the only cause. However, if the thrill persists at a certain definite point, then there is a direct communication between the deep femoral vein through the communicating vein to the saphenous. Knowledge of this is very important, for unless this perforating vein is ligated, the treatment will be doomed to failure. This test is also of value, when positive, in those cases of superficial thrombophlebitis of the calf where there is pain at the site of the phlebitis on coughing. If pressure on the terminal saphenous causes disappearance of the pain on coughing, high ligation will result in almost immediate relief of pain, and rapid clearing up of the thrombophlebitis.

The Schwartz Test uses the same principle of wave transmission by tapping the terminal saphenous and feeling the impulse along the course of the vein. One of the most important tests is, what I call, the Reversed Schwarz Test. It gives information as to the condition of the saphenous system. With the patient standing, the fingers of one hand are gently placed over the terminal saphenous, and a brisk tap is made over each group of varicosities. The feeling of the transmitted wave at the groin signifies the presence of an uninterrupted column of blood with non-functioning or absent valves between the point tapped and the terminal saphenous. Where no impulse is felt, there is no direct communication between the group of veins below and the main saphenous trunk. With this method, a large grape-like varicosity at the calf, without any other visible varicosities on the entire leg, can be found to communicate directly with the upper saphenous, and high ligation will cure it.

If these few basic tests are properly applied and interpreted in each case, it is possible to classify practically all cases of varicose veins from a clinico-pathological standpoint, and apply the proper treatment for each individual case. Only in this way will the highest percentage of cures be obtained and recurrences reduced to a minimum.

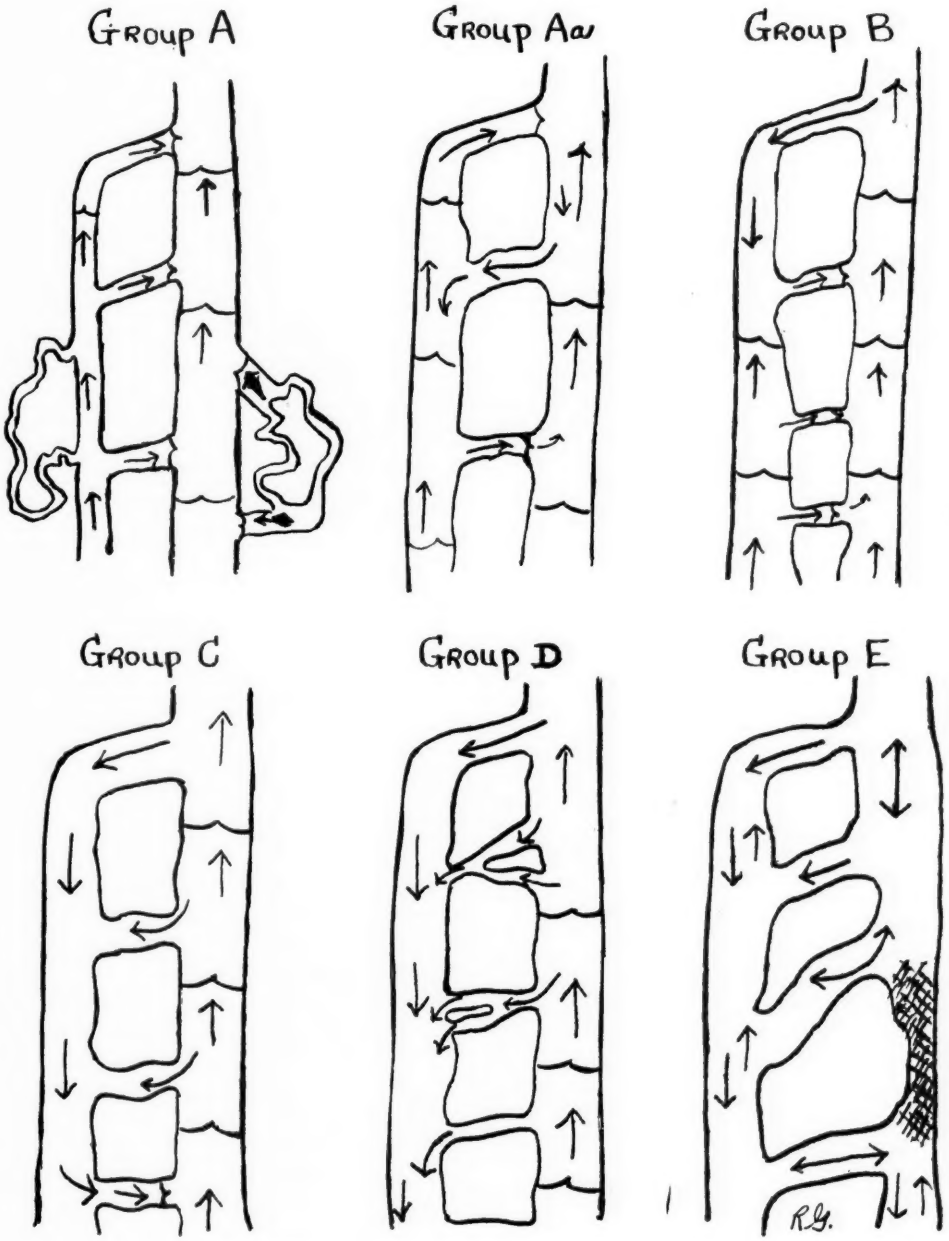
I should like to present the following classification, which covers practically all types of cases, with the treatment indicated in each group:

Group A—

Legs with superficial varicosities along the greater or lesser saphenous veins; Trendelenberg negative, Perthes' negative. Treatment is by injection only and is effective as a cure.

Group Aa—

Legs are Trendelenberg negative, Perthes' negative; Mahorner Ochsner positive because of a single point of



reflux at mid-thigh or knee. Treatment is by ligation at point of reflux plus proper ligation at saphenofemoral junction to insure against recurrence from possible collateral branches; immediate or delayed injection at point of reflux.

Group B—

Legs are Trendelenberg positive, Perthes' negative. Treatment is by proper ligation at saphenofemoral junction, with immediate or delayed injection.

Group C—

Legs are Trendelenberg double positive, Perthes' negative; Mahorner Ochsner positive at one or more definte places. Treatment is proper ligation at saphenofemoral junction without injection and supplemental ligation at site of each perforating branch. Injection is immediate or delayed.

Group D—

Legs are Trendelenberg double positive, Perthes' negative; Mahorner Ochsner positive with so many points of reflux that it is impossible to find them all. These are the long neglected cases. Results in this group are poor, although some relief is offered by ligation at the saphenofemoral junction. Injections may give temporary thrombosis, but recurrences are common. Radical operation using multiple longitudinal incisions, and ligating each group of perforating branches has been advocated by Linton, but I have had no experience with this method.

Group E—

Legs are Perthes' positive. Treatment is supportive only, using elastic stocking or bandage.

The technic of ligation at the saphenofemoral junction, properly done, is not easy. It requires meticulous and thorough dissection. Nor is the operation without hazard. The greatest danger is hemorrhage, due to tearing of the saphenous or injury to the femoral vein by tearing or tying. The operation should be done in the hospital. Each case must be reexamined and tested just before operation, and the position of the terminal saphenous marked with the patient standing, a vertical scratch marking its course, and a transverse scratch, as high as possible, marking the site of incision. The site of each point of reflux must also be marked with the patient standing with a similar cross.

When the patient is on the table, the affected leg is elevated and the dilated veins are thoroughly emptied. At this time, it is impossible to locate the points of reflux unless properly marked. It has been my experience that the oblique incision as close as possible to the groin crease is the most practical. With a 2 inch incision exposure is adequate, and retraction upwards and downwards can be made if necessary. Anesthesia is 2 per cent novocaine, infiltrated along the line of incision, and in a V shaped area above and below to make retraction painless. The incision is carried through the skin; the subcutaneous fat is separated bluntly with a small curved clamp, being careful of the thin walled superficial venous plexus sometimes found under the skin (especially in obese patients). With retraction upwards and downwards, the terminal saphenous will be found to lie just under the deep layer of superficial fascia. This may be quite adherent in cases of long standing ulcer or phlebitis; it must be carefully separated from the vein to avoid tearing it, with resultant very profuse hemorrhage. The saphenous may be very thinned out; if handled carelessly with a forceps, it will rupture easily. Where it appears very thin and dilated, it is better to retract the lower edge of the wound and expose the vein lower down, freeing it completely from the surrounding tissues, double clamping and cutting. Traction is then made on the lower clamp, and the vein is elevated out of the wound, dissecting the surrounding tissues away bluntly, exposing, tying and cutting all branches until about 2 inches of vein are exposed. In this way a deep communicating branch running into the fascia of the thigh, if

present, may be detected and ligated. The saphenous is ligated as low as possible with no. 1 silk, and the 2 inch segment of vein excised. The dissection of the upper saphenous to its junction with the femoral requires careful and delicate dissection. Each branch must be exposed, doubly tied and cut. It is essential that the saphenofemoral junction be visualized and exposed. At times to do this is difficult and dangerous, but it must be done, for very often one or two large veins empty into the saphenous just proximal to the junction; failure to recognize and tie these off will result in time in reëstablishment of the saphenous system. I have had occasion to reoperate two cases that had had a previous high ligation; in both cases, recurrence was due to failure to find one high branch. No attempt to name the branches should be made; just be sure that every one is ligated and cut. The saphenous must be tied off as close to the femoral as possible, without encroaching on or injuring the latter. Heavy no. 3 silk is used; a bite taken into the adjacent deep fascia helps transfix the suture. A second suture is taken through the vein about 1 centimeter distal as an additional safeguard. Care must be taken in tying so that no marked traction or sudden jerk is made, especially in thin walled veins, as tearing of the saphenous bulb, or even the femoral may cause profuse and frightening hemorrhage. If this does occur, pressure with the finger will control the hemorrhage until the femoral is exposed and ligated above and below. There should be no hesitation in doing this, if necessary, as no untoward results occur except some troublesome edema for a few weeks, which will gradually disappear.

Retrograde injection at the time of high ligation is still being done, but I believe it is now the consensus of opinion that this is not necessary. It has been my experience that unless a perforating vein has been overlooked, spontaneous thrombosis occurs in the thigh in the majority of cases when a high ligation has been properly performed. This avoids the severe reactions and pain that are so often seen, especially where the varices are very large. Patients are more comfortable and are able to return to work much sooner. If thrombosis is not complete or does not occur, a subsequent injection in a week or two is usually effectual. In the meantime, the marked dilatation of the veins will have disappeared. Below the knee, however, injection may be done at the time of operation; but here too, it may be delayed, depending on the experience of the surgeon. My rule is, if the veins are markedly dilated, "no immediate injection."

Supplemental ligations for the deep perforating branches are performed at the previously marked sites. Novocaine skin infiltration is used; the incision is about three-fourths inch long. The subcutaneous fat is spread apart with a small curved clamp, whereupon the vein can readily be seen, lying in the wound. It is grasped and brought out, doubly clamped and cut, and each end elevated and freed as far as possible from surrounding tissue, ligated, and the excess venous substance removed. The deep perforating branch can usually be seen on the upper segment; this is also tied and cut. The ends of the vein are allowed to drop back; a single silk suture closes each wound.

Following the operation, the leg is again elevated to empty it of venous blood; a snug gauze or flannel bandage is applied from foot to mid-thigh. The patient is made to walk at once in the operating room. This helps prevent blood from accumulating in the dilated veins, and the muscular action keeps

them fairly empty; nor will thrombosis be as massive or painful. These patients are made ambulatory at once; they are advised not to lie down for more than a few minutes for about eight hours after operation. This tends to prevent extension of the thrombosis through the communicating to the deep veins, and is an important factor in the prevention of embolism. Pain is relieved by codeine and aspirin. The sutures are removed on the fifth day together with the bandage; injections, where necessary, may be started in 2 weeks. Most patients can be back at work one week after operation.

SUMMARY

After a review of the literature on the subject, the author suggests some reasons for failures in this type of treatment in the past. He then gives a brief outline of the anatomy of the venous system of the lower extremity, and follows with descriptions of various tests to determine the extent and character of reflux circulation, together with his own modifications of these tests. He groups patients with various combinations of test reactions both tabularly and by diagram. The balance of the article describes in detail the author's operation for ligation of the saphenous vein at the saphenofemoral junction.

SOMMAIRE

Après une revue de la litterature du sujet, l'auteur suggère quelques raisons pour l'insuccès de cette méthode de traitement dans le passé. Il nous donne une brève revue de l'anatome du système veineux de l'extremité inférieure. Il nous donne aussi plusieurs tests pour déterminer la nature et l'ètendu de la circulation reflue, et aussi certaines modifications personnelles qu'il a opportees à ces tests. Il groupe ses malades d'après ces tests enshcémas et en diagrammes. Il décrit son opération pour ligature de la veine saphène à la jonction de la saphène et de lâ fémorale.

RESUMEN

Después de pasar revista a la literatura sobre el tema, el autor cita las razones que estima responsables del fracaso de esta técnica en el pasado. A continuación describe en cierto detalle la anatomía del sistema venoso de la extremidad inferior y analiza algunas de las pruebas empleadas para determinar la extensión y caracter del reflujo circulatorio, conjuntamente con sus modificaciones personales a dichas pruebas. Agrupa a los pacientes de acuerdo a los diversos tipos o combinaciones de recación a la prueba empleada. En el articulo se describe con todo detalle la operación del autor para la ligadura de la vena safena en la unión safeno-femoral.

Свод.

После обзора научной литературы о лечении варикозных вен лигатурой, автор выражает свое мнение о причинах неудачи этого типа лечения. Он дает в общих чертах анатомию венозной системы нижней конечности и затем описывает разные способы определения степени и характер отливного кровообращения, а также и его собственные модификации этих способов. Таблицами и черетежем он группирует больных согласно комбинации их реакции. Остальная статья посвещена подробному описанию его операции лигатуры venae saphenae y ee влияния с vena femoralis.

BIBLIOGRAPHY

Atlas, L. N. Hazards connected with the treatment of varicose veins. Surg. Gyn. & Obst. **77**:136, 1943.

de Takats, G. E. Ambulatory ligation of the saphenous veins. J. A. M. A. **94**:1194, 1930.

Homans, J. The operative treatment of varicose veins and ulcers based upon a classification of these lesions. Surg. Gyn. & Obst. **22**:143, 1916.

Harkins, H. N. The surgical management of varicose veins; Importance of individualization in the choice of procedure. Surgery **11**:402, 1942.

Linton, R. R. The communicating veins of the lower leg and the operative technique for their ligation. Ann. Surg. **107**:582, 1938.

(Continued on page 388)

Evaluation of Methods of Study of Peripheral Vascular Circulation*

SAMUEL LISKER, M.D.
PHILADELPHIA, PENNSYLVANIA

THE purpose of this paper is to attempt an evaluation of the simpler methods of examination of the peripheral circulation. In view of the space available we cannot hope to cover the entire field of vascular diseases more than superficially. We have therefore chosen a specific problem, namely — advanced organic arterial occlusion with actual or impending gangrene.

During the past two decades, the management of these cases has changed from being a matter of the individual surgeon's experience and intuition to one of careful study of the state of the circulation performed routinely prior to surgical interference. We are now able to foretell with a fair degree of accuracy whether or not surgery is indicated, and if so, at what level it should be done.

In the order of their importance, the methods of examination referred to are: (1) *Careful history taking and detailed clinical examination.* These should include information on the age and sex of the patient, the presence or absence of true intermittent claudication, the time of onset of symptoms and their character, all of which play an important rôle in establishing the diagnosis. The presence of other diseases which may bear an etiological relationship to peripheral vascular disease must be carefully ascertained.

The presence or absence of pulsation in the accessible arteries, the condition of the skin, the effect on skin color of elevating and lowering the extremities and the type and location of gangrenous areas are of paramount importance.

It has been our experience that, in patients examined in this manner, the clinical diagnosis was shown to be correct in the vast majority of cases.

(2) *Oscillometry.* The next method of examination to be considered is oscillometry. The oscillometer enables us to observe the degree of pulsation caused by ventricular contractions in the major arteries. Obviously, any condition which diminishes the stroke volume of the heart or lowers the elasticity of the arterial walls, will depress the oscillometric index.

Unfortunately, the most sensitive of these instruments is rather crude and requires a relatively considerable pulsation of the artery to cause it to register. Not infrequently we have examined patients who have a zero index at the ankle level, yet actually have sufficient circulation to maintain the viability of the toes. The finding of a zero index near the knee, however, is another matter. In this case, the circulation is very seriously diminished, usually below the level necessary for maintaining tissue nutrition which, in the absence of collateral circulation, most often means tissue necrosis.

It is therefore possible for a patient to have a zero index at the ankle, have no palpable dorsalis pedis or posterior tibial artery and yet be in no immediate need of surgery. Patients in this category are usually suffering from advanced arterial disease. In spite of the

* Read at the Ninth Annual Assembly of the American Chapter of the International College of Surgeons, Philadelphia, Pa.

change in the arterial walls, sufficient blood is reaching the toes to keep them viable.

A considerable drop in the oscillometric reading as one proceeds down the extremities indicates damage to the deep vessels, should the reading fall to zero in the neighborhood of the knee or elbow there is most likely a complete arterial occlusion. From the foregoing considerations, it must be evident that the oscillometer at best simply indicates the presence or absence of arterial disease and can be relied on merely to give some idea as to its severity.

(3) *Histamine test.* Another commonly used method of examination is the Histamine test. The technic of this test is the simplest of all. We use the method suggested by Starr, which consists of multiple intradermal punctures through a drop of Histamine Solution 1–1,000 at various levels on the extremities. The normal reaction is the development of a wheal and a flare which should appear within 5 minutes after the inoculation. One of the normal variations seen in this test is the absence of a flare, particularly around the ankle. It is well to inoculate your own hand during the test to be certain that the material is potent. Should the response above the knee be delayed, the patient's hand should be tested, since some patients, particularly the older ones, may have a generally poor response to Histamine. If these safeguards are taken, the test may be more accurately evaluated.

While it is true that the test reveals the state of the subcutaneous circulation, it seems to be a fairly reliable indication also of the degree of collateral circulation, in cases of organic arterial disease. It has been our experience that patients with severe arterial disease of long duration which does not produce actual gangrene, frequently show normal or only slightly delayed Histamine responses. In cases where occlusion is recent and gangrene progresses rapidly, the Histamine reaction is practically always absent. We interpret this to mean that the cases which become stabilized or improve, do so because of the development of an adequate collateral circulation. The cases that deteriorate do not have sufficient time to develop their secondary circulation.

(4) *Skin temperature.* Finally, a brief consideration should be given to the skin temperature. There are numerous types of instruments that were available (before the war) varying from very complex thermocouples to special mercury thermometers. Generally speaking, any instrument that gives fairly consistent readings on recheck of the same patient, is suitable; the simpler it is to operate, the better. We do not believe it necessary to do these examinations under mechanically controlled outside temperatures; it seems that any ordinary examining room where drafts are eliminated and which is neither too cold nor too hot for ordinary comfort, will suffice. The patient should be at complete rest for 15 or 20 minutes before a record is made. It is important that a record of the room temperature be *kept* during the examination for purposes of comparison. Of course in thermocouples that have both terminals exposed to the air, the machine must be standardized at room temperature before it can be operated. Simply reading the temperature of the skin of a patient gives little, if any, useful information, unless there be a wide difference between his two feet. Even here the findings simply suggest abnormality, which may not be due to organic peripheral vascular disease.

The study of surface temperature changes, as a result of vasodilation physiologically induced, or as the result of sympathetic inhibition, is of paramount importance, since any definite increase in skin temperature is chiefly due to an increase in blood flow. Should there be a rise in skin temperature of as little as 4° or 5° F. after paravertebral novocaine block, it is probable that sympathectomy would be of benefit to the patient with severe circulatory impairment.

While it is true that the majority of patients with advanced arteriosclerosis do not show evidence of arteriospasm which can be demonstrated by sympathetic block, an appreciable number do. It is therefore necessary to evaluate each case from the standpoint of arteriospasm, since this is a remediable condition which has considerable bearing on the prognosis of the disease.

Having briefly considered the various methods of examination and indicated their limitations, let us go to a consideration of the patients themselves. At the beginning of this paper I elected to confine myself to a consideration of a specific type of case—namely, advanced organic arterial occlusion with actual or impending gangrene. These patients present one of the most pitiful pictures to be seen in the practice of medicine. They usually spend weeks or months confined to bed, without privileges, surrounded by leg cradles to protect their extremities and usually heated by electric light bulbs.

Those patients who are unfortunate enough to have severe rest pain spend their time in periods of narcosis induced by morphine, alternating with much longer periods of agony. This description is presented for a purpose. I believe that we must find some other method of relieving such pain. The answer to this problem may come from the field of neuro-surgery. There is no doubt that an effectual method for the relief of rest pain will save the lives of many patients who though they seem to be improving from the standpoint of their peripheral vascular disease, succumb to coronary thrombosis or some other vascular catastrophe. There is little doubt that the suffering to which these patients are subjected, bears a definite etiological relationship to the high incidence of terminal vascular accidents. This is particularly true in arteriosclerosis associated with diabetes.

The difficulty of the problem increases directly with the severity of the rest pain. In mild cases, the use of ordinary sedatives alone, or together with paravertebral block is often sufficient. Sometimes it is possible to control mild pain by the use of mechanical devices, such as the intermittent positive pressure cuff or mild radiant heat.

In the presence of severe rest pain, the problem is far more difficult; in these patients it frequently cannot be controlled even with large doses of morphine. Because of the fact that they are under observation for weeks or months, it becomes unsafe to administer sufficient opiates; the whole group of narcotics, hypnotics and sedatives are tried usually with the same poor results. It is not unusual to find two or three different sedatives in use simultaneously.

Unfortunately, there is as yet no acceptable method of controlling pain, but I have no doubt that the solution of this problem would contribute greatly to the rehabilitation of many of these patients and prevent the complications so frequently seen in this group.

For purposes of treatment, these patients may be divided into three types:

Type 1. Without rest pain, these patients are suitable for clinic management. They respond to any recognized

treatment and frequently are completely rehabilitated.

Type 2. Patients with mild rest pain relieved by sedatives, radiant heat, positive pressure cuff or boot. These are better treated in hospitals, especially if tissue necrosis is present. This is usually superficial and not progressive. The vast majority of cases also may be rehabilitated.

Type 3. Patients with severe rest pain made worse by slight elevation of the affected leg or other physical treatment, and which is not relieved by sedatives. Gangrene is usually deep and involves the terminal tissues. The use of the suction pressure apparatus is poorly tolerated and seems to aggravate the condition. The use of this apparatus in the presence of infection is definitely contraindicated. A small percentage of these patients tolerate the intermittent positive pressure treatments; if they do it may be worth a trial.

Generally speaking, any form of physical therapy which aggravates the pain, should not be persisted in, since pain is an index of tissue anoxia.

Discussion

CHARLES ALEXANDER HATFIELD, M.D.
PHILADELPHIA, PENNSYLVANIA

I am glad of the opportunity to congratulate Dr. Lisker on his courage in bringing up for discussion the subject of progressive and painful arterial occlusion. Those of us interested in peripheral vascular disease, know this condition to be ever present, distressing to observe and decidedly recalcitrant to treatment. This chronic, progressive, remarkably painful affliction deserves investigation far beyond that which it has been accorded.

There can be no doubt that adequate history, careful physical examination and all the laboratory and bedside aids can give one a workable impression if not a strictly accurate diagnosis. I know of no category of affections that can have such a wide range of probabilities as that of peripheral vascular disease.

Certain of us will have concentrated on one type of study far more than others. This will, of course, be a matter of preference to the individual. However, a working knowledge of all the aids is most desirable to reduce the margin of error to its minutest possible size.

Oscillometry gives one a very practical working index of the relative volume of arterial blood available to the extremity under consideration. Its finer diagnostic criteria must be mastered. Histamine intradermally gives volumes of information after its varied manifestations have become familiar ground. Skin temperature observations are of tremendous value not only in immediate estimation of the circulatory status but as a prognostic index.

I am more familiar with the skin temperature studies than with any of the others. The temperature rise demonstrated by reflex sympathetic inhibition is a very satisfactory index to the extent of improvement to be anticipated by surgical sympathetic denervation. Actual sympathetic anesthetization, whether local or regional, gives a definite record of potential response.

Skin temperature recordings, with or without sympathetic interference, are subject to local conditions, such as open

lesions, actual gangrene, infection and the like. Diagnostic sympathetic anesthesia, while subject to clinical interpretation, is invaluable. Peripheral nerve trunks may be temporarily anesthetized and the response of the region supplied by these nerves recorded. Similarly, regional blocks by means of the sympathetic ganglia, although considerably more difficult to achieve, give much information as to the potentialities of the circulation in the corresponding limb.

Novocain infiltration of a peripheral mixed nerve or of a ganglion of the sympathetic system will give an immediate response to the extent that the organ is capable. My own experience with a permanent type of anesthesia has been unfortunate. I do not recommend alcohol injection either of peripheral nerves, because of the danger of local thrombosis and paralysis, or of ganglia of the sympathetic system because of the likelihood of peripheral neuritis.

However, surgery of the peripheral nerves does not always produce ideal results. The limb upon which it is performed, may not be able to withstand this additional trauma. There is always danger of damaging the blood vessels that lie in close proximity to the nerves in question. The relief of pain, which is the objective, is not always won. The paralysis resulting from crushing of a mixed nerve may be more distressing than the pain itself.

Before leaving the field of study to discuss that of treatment, I should like to mention a rather new line of investigation of peripheral vascular disease. I do not know the originator of this phenomenon. I do know that it dates back before 1930. The study comprises the introduction of the inert dye, fluorescein, into the general circulation. Upon exposure to cobalt filtered ultraviolet light, all tissue that has an adequate blood supply to maintain life will "fluoresce", that is, will glow with an unmistakeable greenish yellow hue. Variations in blood supply will be demonstrated by the ebbing and flowing of this glow. Absence of viable circulation is indicated by a tissue that does not in any way react to this light. It simply registers the visible purple light that any tissue or material exhibits without treatment. This line of study is dramatic and easily interpreted visually. It permits not only evaluation of the state of the extremity but furnishes visual information on the ability of the limb or area to maintain adequate circulation. This phenomenon alone is invaluable when a difficult decision must be made for or against emergency surgery.

As mentioned earlier, I have given up peripheral nerve crush as a method of controlling pain. Purely surgical methods are not always ideal; it is necessary to enlist the aid of physial therapy. Of the methods available to control the ebb and flow of blood, the one invoking the aid of gravity is the simplest. The oscillating bed takes every advantage of this.

The methods using positive and negative pressure without or within the limb also have great value. The intermittent venous occlusion ritual has a direct bearing on a surgical procedure soon to be discussed. The alternating positive and negative pressure appliance, the "Pavex boot," simulates natural circulation—but with the profound reservation that it must do this from outside. All these treatments have as a "must", namely, the administration of papaverine hydrochloride.

But what can be done surgically for the extremity that shows slow, progressive and painful diminution of the arterial supply? If there is no response to sympathetic anesthetization, it is pos-

sible and feasible to use a mechanical method of forcing dissemination of oxygenated blood through the anoxic tissues. This may be accomplished by ligating the main venous trunk from the extremity to the body. What this accomplishes physiologically is still a subject for discussion. However, it does relieve pain and improve circulation and may produce a latent sympathetic paralysis that is extremely beneficial. It is possible that the actual operation of ligation may interrupt the sympathetic pathways on the main artery closely associated. Hydrostatically, building up a retrograde venous pressure will relax vasospasm.

Should there be demonstrable an element of abnormal vasospasm, there seems to be little doubt that surgical sympathetic denervation offers the most satisfactory and permanent form of relief. However, such procedures do not consist solely of extirpating sympathetic ganglia in the neighborhood of the affected limb. Preganglionic sympathectomy may mean an almost permanent cure, while a postganglionic procedure may only give a period of temporary relief with recurrence of more severe symptoms within a few weeks.

Freeman and his associates showed that postganglionic denervation of the sympathetic system rendered the area, limb, or appendage more susceptible to sympathetic stimuli after the immediate effect of operation had worn off. However, preganglionic interruption provided a semipermanent sympathetic paralysis.

To interrupt the sympathetic enervation of the upper limb surgically by a preganglionic procedure, the following technic is recommended:

An approach is made through the structures that lie above the clavicle on the affected side. The sympathetic chain is divided between the third and fourth ganglia in the thoracic region. The chain is not resected, but the rami communicanti of the third, second and first ganglia are interrupted. The proximal end of the chain so mobilized, is then imbedded behind the fibers of the first or second intercostal muscle. This operation, while being purely preganglionic does not carry with it the unfortunate sequel of a Horner's syndrome. The procedure may be carried out on both sides at one sitting, if so indicated.

Preganglionic sympathetic interruption of the lower extremity is carried out by removal of the first, second and third lumbar ganglia in the female and the second and third only in the male. This operation is carried out through an anterolateral incision in the abdomen with a retroperitoneal approach. If a muscle-splitting incision is used, this does not involve a long or incapacitating convalescence. Avoidance of the first lumbar ganglion in the male prevents the occasional sexual difficulty that can occur.

Where the vascular tree is capable of response, permanent dilatation of the vessels, both efferent and afferent, furnishes the best result from the patient's point of view. There are occasions where the flexibility of the circulation is not clinically demonstrable wherein such dilatation gives profound relief. Personally, I should like to see more attempts made to treat surgically those patients that can possibly withstand it.

(English and foreign summaries of this material will be published in our next issue.)

Observations on the Eyelids

WILLIAM OLIVER LODGE, M.D., F.R.C.S. (Edin.), D.O.M.S., R.C.P.S. (Eng.), F.I.C.S.

HALIFAX, YORKSHIRE, ENGLAND

THE eyes of most vertebrates except fishes and snakes are protected by movable eyelids. In certain lizards which live in sand, the lower eyelid is transparent; that of *Cabrita,* found in India, has in it a transparent disc. On the development and anatomy, I need not dwell. Extreme tactile sensibility is an important function. In man, the eyelids are capable of more than reflex action; they play an important part in expression of emotion. Perdita spoke of:

". . . violets dim.

"But sweeter than the lids of Juno's eyes." *

How different, alas! are the eyelids of alluring youth from the stricken features of a victim of typhus. Between such extremes are subtle variations which doctors subconsciously observe, even before they inspect the tongue; sometimes, anemia, jaundice or myxodema are recognizable at a glance. Physicians use palpation through the closed eyelids to discriminate between diabetic and hypoglycemic coma; in the former condition, the tissues are dehydrated.

The North of England Ophthalmological Society is established among some of the largest centers of population in the world, consequently rare ocular affections are common at its meetings. A classification should pave the way for the few comments which I have to make, put them in their proper perspective and perhaps promote one of those discussions so often more luminous than the original contribution, especially when speakers have travelled widely.

* *(The Winter's Tale,* Act 4, Scene 3.)

COMMENTARY

Obviously one cannot pretend to discuss all these affections. The last defect listed in group 1, ankylblepharon, recalls the persistence of union between the eyelids for some time after birth in carnivora. The protective operation of median tarsorrhaphy is no less valuable in the human adult whenever the cornea is especially vulnerable, for example, in relapsing ulceration. It is an operation one shrinks from but never regrets. It enables those who would otherwise have to be treated as in-patients for long periods to go about their business, and promotes sound healing of the corneal lesion.

A somewhat unusual traumatic case which came under my care recently at St. Luke's Hospital, Bradford, was that of a captain who was directing the fire of a P.I.A.T. gun from a shallow trench. The projectile struck a tank at fifty yards range and the conical fuse cap was blown back into the officer's face, where it penetrated the lower eyelid, rupturing the eyeball, and lodged in the maxillary antrum, whence it was removed through the wound of entry. The eyeball was removed and the eyelids sutured. A visor would have prevented this injury.

Some blisters on a boy's eyelids were so suggestive of Lewisite burns that he was taxed with being in unlawful possession thereof. The admission of

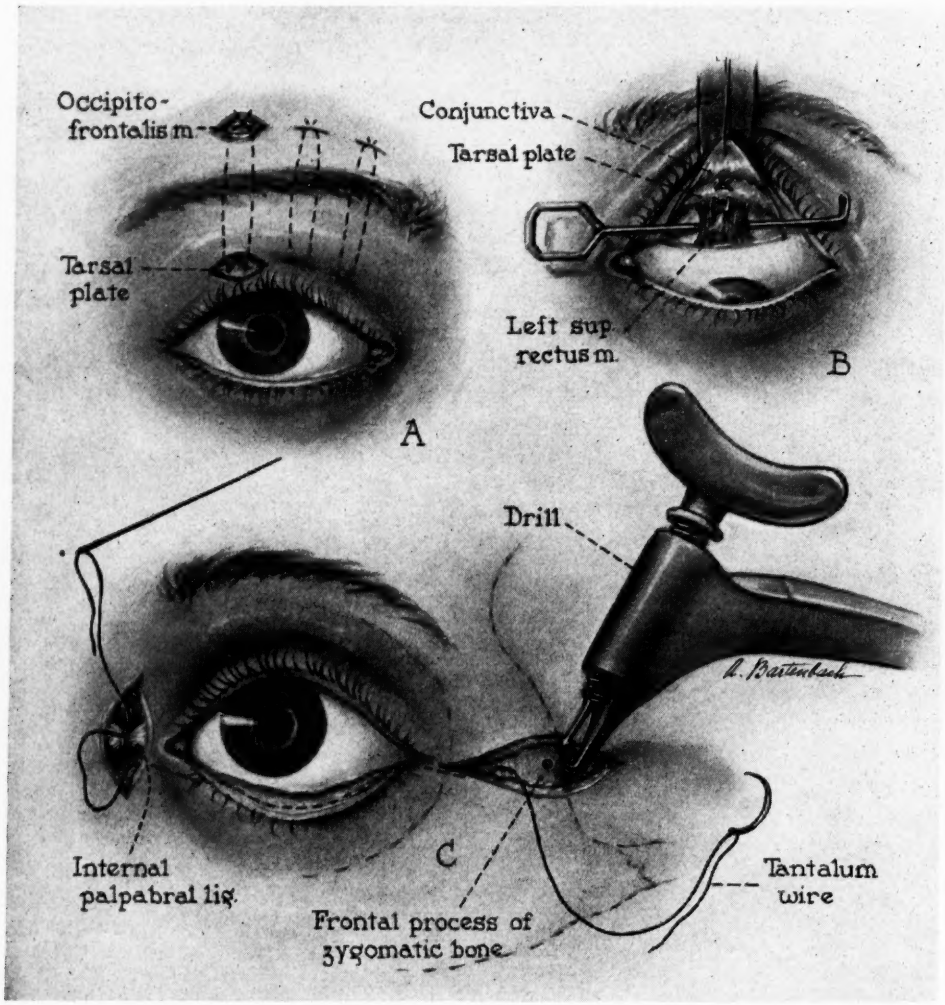


Fig. 1. Demonstration of wiring the eyelids for neuroparalytic affections with .003″ tantalum wire. *A.* Ptosis treated by connecting the upper border of the tarsal cartilage to the occipito-frontalis. *B.* Ptosis treated by suturing the upper border of the tarsal plate to the central fibres of the superior rectus muscle. *C.* For paralytic ectropion of the lower eyelid, one end of the wire is connected to the internal palpebral ligament and the other to the zygomatic bone, in which a hole is drilled by means of a special punch. The wire passes submuscularly.

other delinquents, blistered elsewhere, clinched the diagnosis. The boys were duly visited by the competent dermatological authority at the Royal Halifax Infirmary.

Cicatrical ectropion from petrol burns is common in war time. If the burn has been superficial, it may be advisable to wait for twelve months before operating. Regeneration may occur as it does in the donor area for a skin graft. The eyelid then resumes its natural

SOME AFFECTIONS OF THE EYELIDS

1. Congenital.	Cyclops. Coloboma. Duplication of the outer canthus. Ptosis. Trichiasis and districhiasis. Atresia of lacrymal punctum. Ankylblepharon.
2. Traumatic.	"Black eye." Wounds, bites, burns, physico-chemical injuries (symblepharon).
3. Neuroparalytic.	Anaesthesia. Paralytic ectropion. Spastic ectropion. Tic. Ptosis.
4. Vascular.	Pulsating exophthalmos. Lymphoma.
5. Infections.	(a) Viruses: Herpes. Vaccinia.
	(b) Bacteria: Ophthalmia neonatorum. Erysipelas, cellulitis. Leprosy. Lupus, and tuberculosis of facial bones. Staphylococcal. Streptococcal. Diphtheritic. Anthrax. Blastomycosis.
	(c) Fungi.
	(d) Trachomatous.
	(e) Spirochaetal: Spirochaeta pallida. Spirochaeta pertenue. Leishmaniasis.
	(f) Protozal: Filariasis. Trichinella spiralis.
6. Cutaneous.	Xanthelasma. Dermatitis. Pemphigus.
7. Neoplastic.	Retention cysts, e.g. chalazion. Papilloma. Naevus. Neuroma. Molloscum contagiosum. Rodent ulcer. Sebaceous carcinoma. Squamous epithelioma. Melanoma. Metastases.

position spontaneously. A reliable method in severe cases is to transplant a whole-thickness skin graft from the back of the pinna. This skin is supple,

Fig. 2. Case of bilateral congenital ptosis and epicanthus, after insertion of tantalum sutures into the right upper eyelid.

of the right color and inured to exposure, and fibrocartilage may be transferred with it. The resultant postauricular defect is made good with a dermatome. Incisions should be made not along the orbital margin, but within suture-hold of the eyelashes, to avoid lymphatic stasis and unsightly edema in an isolated area of normal skin. This simple but successful procedure supersedes many major plastic operations.

Passing from injuries, disturbances of innervation provide us with much material of surgical interest. Spastic entropion may sometimes be corrected by painting the lower eyelids with col-

lodion or "Portex" plastic skin. For paralytic ectropion due to long-standing facial paralysis, the following new technique is worthy of consideration.

Two short incisions are made, exposing the internal palpebral ligament and the frontal process of the zygomatic bone (which is girder-like in cross section), respectively. Through the latter, a hole is drilled, preferably with a guarded screw-action drill. A length of .003 inch (.0075 cm.) tantalum wire doubly armed with suitable needles is passed horizontally through the lower eyelid, submuscularly, avoiding the inferior canaliculus and angular vein, and secured medially to the tendo oculi and laterally, after adjusting the tension to allow for slight future eversion, if necessary, to the zygomatic bone. This operation is shown in progress in the accompanying illustration (fig. 1*C*). If the region is not free from infection, an alternative lid-lifting operation may be more suitable. (In the discussion on this paper, it emerged that wiring the malar bone would be useful in Krönlein's operation.) The elaborate fixation shown in Fig. 1 was designed for permanence, but a good hold of fascial tissue may prove to be all that is necessary.

To present two operations for ptosis needs no excuse:

A girl, aged 6, had been treated successfully for epicanthus when twelve months old by insertion of a large graft of costal cartilage under the bridge of the nose. The parent had been instructed to bring the child back for operation for congenital ptosis in a few years' time. On examination, bilateral symmetrical ptosis was pronounced (Fig. 4). The child had to tilt the head backwards, or raise the eyelid with a finger in order to look straight forward. The palpebral apertures were narrow; the caruncles were imperfectly developed.

On January 21, 1946, under general anesthesia, three .003 inch (.0075 cm.) tantalum wire sutures were inserted subcutaneously and submuscularly in such a way as to connect the upper border of the tarsal plate with the occipito frontalis muscle (fig. 1*A*). Short incisions were made at the extremities of the sutures to define the tarsal plate and bury the knots in the wire. A satisfactory improvement was noted; the sutures as usual did not cause the slightest reaction.

On February 4th, the left eye was operated on by the following method: after introducing a speculum, the insertion of the left superior rectus muscle was exposed with the aid of a bodkin. Through the same incision (fig. 1*B*), the upper border of the tarsal plate was reached by eversion of the eyelid and retraction of the conjunctival incision with the help of a catgut suture; there was little difficulty in making the smooth pale pink shining tarsus protrude from the conjunctival wound, and in stitching it by .003 inch tantalum wire to the superior rectus.

Of the two operations, that on the left eye promises to yield a slightly better result, but in each case, there is now a well marked fold in the skin, which was formerly flat. Perfection in such a case is manifestly impossible, but the parent is highly satisfied.

Now that men are being flown home from the tropics, it is necessary that we should be on the alert for tropical disease. A drawing of an oriental sore of the lower eyelid of a young lascar was shown at the meeting, and under the microscope were specimens of *Leishmania donovani.* Specimen A and B, kindly lent by Dr. Gartside, showed the parasites as found in man. Specimen C showed the flagellated form found in the sandfly and in artificial culture media. It is supposed that these two forms of the parasite are asexual and sexual respectively. Calabar swellings, due to *Loa loa,* which is often to be found in the lower eyelid, may recur long after return from the tropics. When coöperating in the investigation of epilepsy in soldiers returned from abroad,

the possibility of cysticercosis should come to mind; *Trichinella spiralis* is a commoner cause of swelling of the eyelids.

With regard to infective conditions, it is significant that infective agents have passed through evolutionary stages, just as their hosts have done. For instance, concerning syphilitic primary sore of the eyelids, spirochetes are asexual, reproduction being by transverse division into two, in a manner vegetable rather than animal. Originally, under the crowded conditions of tropical tribal life, propagation was easy; with the gradual assumption of a specialized venereal mode of transmission, the *spirocheta pallida* took on a new virulence and tendency to affect the nervous system. The Wassermann and Kahn reactions are positive in yaws, which is due to *spirocheta pertenue*. Somewhat similarly, variola is the virulent form of vaccinia and on passage through the calf, reverts permanently to type. Vaccinia pocks on the eyelids are occasionally to be seen in nursing mothers.

Edema of the eyelids due to malignant pustule of the face would certainly call for treatment with penicillin.

Another affection which calls for prevention rather than cure is ophthalmia neonatorum. For prophylaxis against *Neisseria gonorrhoeae* infection among men on liberty from allied warships, sulphonamides have been used. Penicillin might mask a spirochetal infection. For prevention of ophthalmia neonatorum, in cases where it is especially to be feared, administration to the new born infant of sulphonamides, one grain per pound of body weight per day, given four-hourly, is, in my opinion, to be recommended, and I should place considerable reliance on penicillin drops, up to 2,500 units per c.c. for prophylaxis. For curative treatment, I do not subscribe to the view that in-patient treatment is no longer necessary; resistent cases are seen sometimes. I consider that affected infants should not leave hospital until three smears have been negative.

Other affections should be mentioned briefly. Medical officers who have returned from the East may have something to say about trachoma, and the effect of the latest antiseptics in combatting secondary infection. The commonest allergic affection of the lower eyelid is atropine dermatitis, but exotic rashes on the eyelids are sometimes set up by primulas. Malignant melanomas sometimes present themselves as minute pigmented tumors near the lid margin; excision is imperative. In connection with gamma or X-radiation of naevi, the possibility of producing cataract should be borne in mind. Among remedies for sessile papilloma, surgical diathermy still reigns supreme.

CONCLUSION

The eyelids are interesting and essential structures, liable to many of the diseases to which flesh is heir. Some forty affections are enumerated and comments made on a few of current medical and surgical interest.

CONCLUSIONS

Les paupières sont des structures intéréssantes et essentielles. Souvent elles offrent les prémiers symptômes d'une affection systémique et aussi elles fréquemment sont le siège d'affections de la region oculaire. A peu près quarante différentes maladies intéressant la région palpébrale sont énumérées. L'auteur discute quelques—unes présent—aut un intérêt médical et chururgical.

RESUMEN

Los párpados constituye una estructura anatómica muy interesante capaces de sufrir muchas de las enfermedades que toman asiento en la piel. Con frecuencia son los párpados el factor que nos pone en guardia sobre la presencia de una afección orgánica general, aparte de ser ellos, precisamente, los que muestran los síntomas precoces de las afecciones peculiares de la región ocular.

Se enumeran unas cuarenta afecciones a este respecto y se comentan algunas de las de más actualidad e interés médico-quirúrgico.

Свод

Веки являются интересными и существенными органами, подверженными многим болезням тела. Часто, помимо ранних симптомов чисто глазных болезней, они дают первые симптомы системных заболеваний. Перечислено около сорока болезней с ссылкой на некоторые болезни особенно интересные во врачебном и хирургическом отношении.

REFERENCES

Manson's Tropical Diseases, London, 1941.
The Medical Uses of Sulphonamides, Med. Research Council War Memorandum No. 10. H. M. Stationery Office, London, 1945.

(Continued from page 369)

lumière l'etiologie soit un traumatisme, une inflammation de l'iris ou une autre cause. Il présente trois cas.

RESUMEN

El autor analiza los fracasos que siguieron a los primeros intentos de reconstrucción pupilar y achaca a ellos el motivo por el cual se descuida en la actualidad dicho procedimiento. Cita varios casos propios, operados con éxito, y detalla la técnica operatoria en dos de los casos; en uno de ellos empleó su método personal para el restablecimiento de por lo menos una visión parcial en los individuos que han perdido toda la función óptica excepto la percepción luminosa por causa de lesiones traumáticas, iritis u otros motivos. Comunica tres casos.

Свод.

Автор считает, что прежние неудачи попыток конструкции искусственного зрачка являются возможной причиной теперешнего пренебрежения этой важной меры. Он упоминает несколько серий своих собственных случаев, которые были успешно оперированны, и дает простое описание двух операций, одна его собственная, для реставрации, по крайней мере, частичного зрения у больных, которые потеряли от повреждения, ирита или других причин всю перцепцию за исключением световой. Он описывает три случая.

REFERENCES

1. Speath, Edmund B.: The Principles and Practices of Ophthalmic Surgery, Lea & Febiger, Philadelphia 1939.
2. Fuchs, Ernest: Exudative Covering in Chronic Iritis, Graefe's Arch., **123** (May) 1929.
3. Goldfeder, A. E.: Operative Treatment of Iridodialysis, Klin. Monatsbl. f. Augenh., **89** (Aug.) 1932.
4. Mera-Weigandt: Ribbon-shaped Opacity of the Cornea, Klin. Monatsbl. f. Augenh., **78** (Feb.) 1927.
5. Triebenstein, O.: The Question of Rodent Ulcer, Klin. Monatsbl. f. Augenh., **82** (Feb.) 1929.
6. Atkinson, Donald T.: External Diseases of the Eye, Ed. 2, Lea & Febiger, Philadelhia, 1937.

(Continued from page 376)

Mahorner, H. Radical operation for severe varicose veins and varicose ulcer. South Med. Jour. **34**:478, 1941.
Mahorner, H. R., and Ochsner, A. A new test for evaluating circulation in the venous system of the lower extremity affected by varicosities. Arch. Surg. **33**:479, 1936.
Ochsner, A. Lewis' Practice of Surgery, 12: Chapt. 5A, 1–59.
Sarma, P. J. Recurrences and failures following the modern treatment of varicose veins. Surgery **10**:752, 1941.
Sherman, R. S. Varicose veins: A suggested operative procedure. Calif. & West. Med. **57**:192, 1942.
Yeomans, Frank C. Sclerosing Therapy, Williams & Wilkins Co.

The Responsibility of the Surgeon in the Preservation of Human Fertility*

FRANCES I. SEYMOUR, B.S., PH.G., M.D.† AND ALFRED KOERNER, LL.B., M.D.
NEW YORK CITY

THE objective in the practice of medicine is to preserve, insofar as it is possible, the life and health of people. We give prenatal advice at the very incipience of life, assist at the turmoil of labor, administer prophylaxis in childhood, combat the lurking dangers of adolescence and help mature man through the thousand and one disabilities to which he is heir. Today, due to the vicissitudes and horrors of a global war, we must prepare ourselves for new and greater service.

CHART I

TOTAL WAR
presents
GLOBAL REPOPULATION PROBLEMS

Caused by:

1. Male decimation resulting in decreased number of marriageable males.
2. Sex ratio imbalance.
3. Shifts in population.
   - A. Civilian evacuation in war areas.
   - B. Prisoner transplantation.
   - C. Industrial migrations (defense plants, etc.).
4. Sterility (see chart: Causes of Male Sterility in War).

The Doctor's Responsibility to the People:
Restoring fertility to the eugenically sound.

One of the phases of our medical obligation which has received too little attention in the past, but which has been highlighted by this war, is that of the preservation of human fertility. Every nation depends upon its population and the stamina of that population for its strength. War has destroyed too much of our best material. The decrease in the male population has dangerously upset the sex ratio. Male sterility has been greatly increased through the injuries and hazards of war. The problem of global population is so acute that we must restore to fertility all individuals of eugenically sound stock. In addition, we must urge those best endowed for parenthood to have larger families than is now fashionable among them. In view of these facts, we believe that every case that comes to a surgeon's attention must have a thorough investigation of the factors governing fertility.

The White House report of January 1940 brought to light the startling differences that manifest themselves in American fertility. It pointed out three remarkable facts: (1) that a preponderance of children were born to parents living in rural areas, (2) that a striking number came from foreign born parents, and (3) that an alarmingly large number occurred in families in the lower income brackets. The report further showed the extremely unsatisfactory results from this type of breeding. For example: There were in 1940—(a) 360,000 idiots and 1,800,000 mentally defective children in the United States; (b) several hundred thousand children who do not go to school; (c) 12,000,000 children who belong to families with an annual income below $480; (d) 23,000 delinquent children who reside in State

* Read before Ninth Annual Assembly, U. S. Chapter, International College of Surgeons, Philadelphia, Pa.

† Medical Director, National Research Foundation for Eugenic Alleviation of Sterility, New York City.

Institutions; (e) 180,000 children annually who are brought before juvenile courts as delinquents.

Judging by the answers given to census takers in 1940, sanitary living conditions throughout the country were far below acceptable standards.

CHART II

RECORDED FROM 1940 CENSUS QUESTIONS

1/6 of entire population of U. S. A. live in homes where there is less than one room per person—6,000,000 families in 37,325,470 homes in America.

The following facts and figures are on 36,900,000 homes:

22%—nearly 1/4—have no electric light;
40%—have no bathing facilities;
35.2%—have no flush toilets;
31%—nearly 1/3 of all dwelling units, are without running water;
2.8%—have no toilet facilities, not even a privy.

Do you know that in New York City, houses condemned as unfit for living 40 years ago are still standing?

In the same year, 1940, it was estimated that in the United States: (a) 25 per cent of the population was diabetic; (b) One in every ten persons was syphilitic; (c) One out of every eight would be confined to an institution for the insane during his lifetime; 90 per cent of all insane were victims of inheritable insanity; (d) 80 per cent of all criminal cases come from weak-minded parents; (e) The "I.Q." of the U. S. population as a whole was at the mental level of a *12 year old child.*

Selective Service not only substantiated these figures but demonstrated that they were *conservative.* Prior to Pearl Harbor, one out of two of our young men failed their physical examination. The subsequent need for increased man r necessitated the standards being lowered; after they were lowered, four million of our boys were still found unsuitable for military service. Of the four million, 35 per cent were discarded for mental conditions!

Very little comfort can be taken by any of us in this state of affairs. All organizations, whether political, educational, economic, medical or religious, should bow their heads in shame for their sad lack of coöperation and integration in the past.

This is not the place for a diatribe against the factors which have caused this breakdown of the health of the American nation or the weakening of the disciplinary force in the American home. What we must be concerned with, *here and now,* is the problem of building up a *new generation.* We know that such a generation must be protected throughout its formative period by the best possible environmental factors. However, we learned long ago that even the best environment *alone* will not save stock that is dysgenic.

Good government, as well as good medicine, depends upon education—not the education of the gifted few, but the intensive education of the masses. Medical men have received the most thorough type of training that our modern civilization offers. By this fact alone, they automatically become vested with potential leadership and must foster every measure which will tend toward the betterment of the nation's health.

One of the obvious sources of such improvement is the enlargement of well endowed families. Terman has pointed out that the greatest percentage of gifted children in this country, has come from the professional group.

OCCUPATIONS OF PARENTS OF GIFTED CHILDREN

Proportion among fathers of gifted children	Proportion in Population of Los A. & San F. (1910 census)	% of quota among fathers of gifted children
Professional group...29.1%	2.9%	1003%
Public Service group 4.5%	3.3%	137%
Commercial group...46.2%	31.6%	128%
Industrial group....20.2%	57.5%	35%

10 times as many gifted children come from the professional group as from the population at random.

(From Terman's *Genetic Studies of Genius*)

It is therefore obvious that the professional group, numerically by far the smallest, produces the best mentally equipped children. Unfortunately, they also produce the *fewest* children per family. A considerable national upswing would result, if such families could be influenced to increase the number of their offspring.

War is notorious for depleting our store of "1A's" and building up a reservoir of "4F's." Our socio-economic responsibility blends with our medical duty, to salvage as much from the wreckage as possible. Therefore, the all-important consideration that must receive the surgeon's attention is the question of fertility. No matter for what reason the patient comes to you, the larger national responsibility demands that you investigate the question of his procreative powers.

In peace time, the surgeon can prevent many causes of male sterility by careful and early treatment. This is particularly true of the treatment of gonorrhea. The hazards to a man's fertility may come through involvement of the genitourinary tract by primary invasion, or may arise by secondary extension from adjacent structures.

CHART III

SOME CAUSES OF MALE STERILITY IN TIME OF PEACE

Infections

1. Acute—Mumps, gonorrhea, infections causing pyrexia.
2. Chronic—Tuberculosis of G. U. tract, locomotor ataxia, etc.

Endocrine Disorders

Pituitary, gonadal, thyroid, etc.

Absent or Undescended Testes

Deficiency Diseases

Avitaminosis (especially of vitamin E)—severe anemia.

Errors in Coital Technic

Over-Indulgence

Accidents

A. Injuries to the G. U. tract.
1. Traumatic. 2. Surgical.

B. Overexposure to X-ray or radium. (in doctors, technicians, etc.)

Toxic States as:

Uremia, chronic fatigue, cachexia, etc.

Industrial Diseases

Poisoning by metals or their products, as: Lead, radium, radon, etc.

New Growths of G. U. Tract

Addictions

1. Chronic ethylism. 2. Morphinism, etc.

Idiopathic Factors

Reproductive incompatibility.

Any Combination of the Above

Spermatogenic Disturbances Manifesting Themselves as:

1. Oligo, necro, azo, or aspermia.
2. Suboptimal sperm longevity.
3. Sterile motile sperm.

Conservative treatment and chemotherapy will do much to preserve fertility, frequently endangered by posterior-urethral complications.

Careless postoperative radiation therapy has caused much unnecessary sterility. Screening of the essential tissues and regulation of dosage, must be practiced, even by the most expert of operators. In performing herniotomy on young males, we must not forget to give especial care to the ilioinguinal nerve, accidental severance of which, not infrequently causes testicular atrophy. Nor can cryptorchidism be too long neglected, without paying a staggering penalty.

CHART IV

SOME CAUSES OF MALE STERILITY IN TIME OF WAR

Battle Casualties

A. Bullets, grenades, shrapnel, burns to genitalia (flame throwers, etc.).

B. Wounds from below: land and marine mines and torpedoes; "booby traps."

C. "Shell-shock"; brain injuries.

D. Concussion in air; concussion in water.

Tropical Diseases

Malaria.
Filariasis.
Yellow fever.

Filth-borne Diseases (by lice, rats, mice, flies, ticks, etc.)

Typhus.
Typhoid.
Bubonic plague.
Cholera.

Venereal Diseases

Diseases of Malnutrition

Avitaminosis, the anemias, starvation, etc.

Extreme or Long-Standing Exposure

Prison camps.
Concentration camps.
Fox-holes and trenches.
Privation through being lost in jungle.

Punitive Sterilization by Castration

(a) Surgical.
(b) X-ray.

Hamilton Bailey[1] has stated that we may expect more urethral wounds at the end of this war than in the last, because most modern explosive weapons (such as land mines, marine torpedoes and bombs) tend to wound from below. Many of these wounds may be overlooked and will remain undiscovered until complications set in, because the associated injuries elsewhere, will occupy our principal attention. Frequently, the site of entry may be in the buttock, the abdomen or the thigh—all a good distance from the urethra. Bailey[1] states, that one third of the deep wounds to the urethra, are complicated by fracture of the pelvis. Young[2] drew our attention to the fact that, in this type of injury, sterility may arise from occlusion of the ejaculatory ducts. We are principally indebted to Hagner for emphasizing the fact that tubules of the testicles closed by infection or other causes, may be short circuited to permit the release of sperm formerly imprisoned at the point of blockage. Lowsley found that epididymovastomy was successful in 25 per cent of his cases. Other surgeons claim higher percentages of success.

There are many reasons for lowering of female fertility. Tubal block or atresia, tumor formation and endocrine dysfunction are among the commonest. As you all know, surgery can do much to alleviate these, as well as many other causes of female sterility. In our office we find that a complete work-up at the beginning of the investigation, will do much quickly to locate the causative factor or factors. In our work, we find that the greatest single aid to diagnosis is uterosalpingography. Retroversion, bicornuate uterus, anomalous accessory tubes, are all shown up with great clarity by this method. In suitable cases, when scheduled for surgery, and where there is also a history of sterility, a

CHART V

EXAMINATION PROCEDURE

A *Complete (Standard) Physical Examination* is given every patient.

In addition the following investigations are recommended:

MALE

I. *Review*—
of reports of referring physician recommending consideration of artificial insemination.

II. *History*—
Including genealogical investigation.

III. *Physical*—
Including sperm examination.

IV. *Serology*—
Including Rh factor studies.

V. *Testicular Puncture*—
In cases of possible genito-urinary block.

FEMALE

I. *Uterosalpingography*—
to establish tubal patency (performed by referring physician).

II. *History*—
with special search for dysgenic factors.

III. *Physical*—
Including bimanual and pelvic examination.

IV. *Gonadal Studies*—
Ovulation; vaginal smear.
Endometrial biopsy (especially useful in cases nearing menopause.

V. *Serology*—
Rh factor and blood group studies; Wassermann, Hgb., etc.

CHART VI

RECLAMATION MEASURES IN WAR AND PEACE

In Temporary Sterility

MALE

I. *With Blocked Vas Deferens*
Hagner operation (20 to 25% success).

II. *With Genito-Urinary Infections*
(a) Chemo and biotherapy (sulfa products).

III. *By use of Plastic Surgery for*
(a) Congenital or
(b) Acquired defects.

IV. *Treatment of Idiopathic Sterility*
Physiotherapy, diet, hygiene, medication.

FEMALE

I. *Tubal Block*
(a) Repeated tubal insufflations in selected cases (Rubin procedure).
(b) Operation (results not good).

II. *Surgical Relief in Miscellaneous Conditions*
Conization of cervix; D. and C.
Removal of uterine polyps, myomectomy, unilateral salpingectomy, or cophorectomy.

III. *Anemias*
Diet, medication.

IV. *Endocrine Conditions*
(a) Obesity—reduction.
(b) Hypothyroidism—thyroid therapy.

In Absolute Sterility

MALE

Cross-Artificial Insemination.

FEMALE

Adoption.

---

preoperative uterosalpingogram will give the surgeon much helpful information. Besides, terminally blocked tubes can be opened at the time of the operation.

In cases of absolute male sterility, cross-artificial insemination is advocated.

The criteria for donor selection are clear cut.

CHART VII

INDICATIONS FOR CROSS-ARTIFICIAL INSEMINATION

I. Absolute sterility of husband.

II. Temporary sterility of husband whose wife is near end of child-bearing period.

III. Temporary sterility of husband whose spermatogenic function is defective.

IV. Husband with transmissible dysgenic factors.

V. Sterile motile spermatozoa.

VI. Rh factor incompatibility.

VII. Repopulation of male-depleted countries.

CHART VIII

CRITERIA IN DONOR SELECTION

I. Genealogy free from hereditary taint; ancestral history known and traceable.

II. Past performance must show definite achievement.

III. Physical condition excellent.

IV. Mental status above average.

V. Wife must give consent to this work.

VI. Rh factor must be same as recipient's.

VII. Blood group same as husband's.

VIII. Physiognomy must resemble sterile husband's.

CONCLUSIONS

1. The White House report of Jan. 1940 and the Selective Service draft have both shown that our male population is woefully below par.

2. Statistics by Terman and others have shown that while families of high I.Q. would be better prospective parents, they have fewer children than those in the lower groups. Therefore, they should be encouraged to increase the size of their families.

3. Eugenics must be a primary consideration in the practice of medicine since it affects our national well-being as well as our national wealth. This may mean legislation.

4. It is the surgeon's duty to alleviate temporary sterility in both men and women where eugenically justifiable.

5. In all cases of absolute male sterility, fertile women of good stock should be given an opportunity for motherhood through cross artificial insemination.

6. Medicine today must concern itself no longer *only* with *individual* health problems, but with *national* health as it affects our country as a whole and the world at large. "Pro Omni Humanitate."

SUMMARY

The author states that a grave responsibility rests on the shoulders of the learned professions as a whole, and medicine in particular, not only to help to raise the physical and eugenic standards of American living, but for its present low status. She cites the figures of the White House report of 1940, also the observations of Selective Service. She then goes on to outline some of the steps that may be taken by each medical man as an individual, to help alleviate, here and now, some of the evils that these two agencies have uncovered. In a series of charts, she shows various inter-relationships between cause and effect, and results to be obtained by the measures he advocates.

SOMMAIRE

L'auteur nous enforme qu'une grande responsabilité pèse sur les epaules des professions scientifiques et surtout sur la profession médicale. Elle s'agit d'élever les standards physiques et eugéniques de la population américaine.

(Continued on page 399)

Occupational Therapy in the Rehabilitation of Surgical Cases

HELEN S. WILLARD, B.A., O.T.R.*
PHILADELPHIA, PENNSYLVANIA

THE problem of rehabilitation which confronts us at the present time is the greatest that the world has ever known. Thousands of men whose lives would have been lost save for the magnificent achievements of the medical profession, are leaving our hospitals to seek reëstablishment in civil life. We owe them every possible service which may reduce their disabilities, speed their readjustment and prepare them to earn an adequate living no matter how severe their handicaps.

Since World War I, increasingly well developed and organized methods of rehabilitation have been established. The war manpower stortage gave the opportunity *par excellence* to prove that the handicapped worker can do as good, or often a better job, than his normal brother. Many employers are more willing to employ disabled persons than they were before the war but, with the reconversion of industry, the able-bodied worker will again tend to supplant the person who has limitations of physical or mental ability.

Among the methods of rehabilitation which gained great impetus from World War I was occupational therapy. Practically no formal training in this field had been given prior to 1918. At that time, when General Pershing made a request for one thousand Reconstruction Aides in Occupational Therapy, training schools were established. After the war, because of the civilian need, the schools were urged to continue their courses. Programs have been lengthened from three months to three year or five year courses which combine the achievement of a college degree with specialization in occupational therapy.

The acceptance of occupational therapy as a recognized adjunct of medical treatment has been evidenced by the steadily increasing demand for graduates of the training schools. Even during the depression, this was greater than the available supply. In 1935 the American Medical Association set up standards for acceptable schools. The establishment of the Baruch Foundation for the development of physical medicine and the increased sponsorship of this work by the Council on Physical Medicine of the American Medical Association open opportunities for research and development. The urgent need for sufficient trained occupational therapists for service in military hospitals necessitated the establishment by the War Department of a completely subsidized emergency training course given in several of the accredited schools. The need for more therapists occasioned the opening of new training courses, so that there are now (1944) twenty-two schools or courses as compared with five in 1940. Recent rehabilitation laws include occupational therapy as one of the services to be made available for war casualties and civilians. All these facts are proof of the recognized place of occupational therapy as a valuable treatment measure.

There is, however, still much misunderstanding of the proper use of occupational therapy, its relationship to

* Director, The Philadelphia School of Occupational Therapy.

other treatments and its exact place as a factor in rehabilitation. There are few persons who are suffering from illness or injury who may not be benefitted by some form of occupation. In this paper, however, we shall confine ourselves to a discussion of its use in the treatment of surgical cases.

There are three major ways in which occupational therapy may be of real value to the surgeon in the treatment of his patient; (1) as diversion, (2) as exercise for restoration of physical function and (3) as prevocational training.

Napoleon said that morale was three times as important as material. General Marshall is quoted as saying that he places the odds in favor of morale as five or even ten to one. The morale of a person disabled by illness or injury is as important in the winning of his battle for recovery or adjustment to handicap as is the morale of the soldier on the battlefield. The will to fight and the will to live are closely related.

Morale is maintained primarily by keeping a person constructively occupied. It is the individual who has nothing worthwhile to do, who has lost faith in his ability to fill a useful place in the world who recovers slowly, who fails to readjust, who decides that life is not worth living.

Occupational therapy for pre- or post-operative surgical cases, for patients confined to bed or the semi-ambulatory, consists primarily of recreational or educational activities or handcrafts, because of the ease with which these can be done under hampering circumstances and because of the satisfaction which tangible creation gives to most people. The variety of skills which the trained therapist possesses makes it possible for her to find projects which will interest patients of widely different backgrounds, education and disabilities. Occupations as diverse as the types of her patients, permit her to meet their individual needs and so to lessen the fears and worries which destroy morale. Dr. Louis B. Wilson, formerly Director of The Mayo Foundation, has said, "the . . . man who has . . . no perfectly useless bit of knowledge with which he may play, is apparently a fit subject for merciful euthanasia."

We are sometimes accused of teaching our patients useless, trivial activities but all the things human beings do for recreation and diversion are not necessarily useful. The occupational therapist knows the joy and peace that has come to the little Italian, who, recovering from a spinal graft, refused all suggested occupation and lay silent and morose in his bed, until he discovered that he could learn to make a useful basket as he had seen his grandfather do back in Italy. The stevedore, who tossed feverishly, thereby preventing the healing of his broken leg, lay quiet when he became absorbed in carving toys for his children. The lawyer, nervous, irritable, tense, following a serious automobile accident, found absorbing interest in bookbinding though, before his illness, he had never known the joy of working with his hands. The little French girl, stricken unto death, lay cheerfully looking forward to the visit of the therapist whose stumbling French she could correct and improve and so make her contribution and prove her usefulness. No one can gainsay the value of diversion and recreation. The surgeon who has available the services of a well trained occupational therapist realizes that his work has been made easier and his results better by the use of her skills.

Sir William Osler said, "No man is really happy or safe without a hobby and it makes little difference what the outside interest may be—botany,

beetles or butterflies, fishing, mountaineering or antiquities." Diversional therapy serves the purpose of easing the patient's period of subacute illness, speeds his convalescence, affords exercise for unused muscles and may provide a hobby.

The programs being carried out in the rehabilitation centers of the Army and Navy both here and in Britain, have proven without question that properly supervised diversion and recreation greatly speed convalescence and increase the degree of recovery. Much of such work may be done by volunteers or recreational directors, but in the hospital proper the services of a trained therapist are needed to guide and select treatment. There is much food for thought in these war experiences as to future modifications in our civilian hospital procedures.

Occupational therapy as exercise for the restoration of function after physical injury is closely related to physical therapy. The two types of treatment should work hand in hand under coördinated medical supervision. The Council on Physical Medicine of the American Medical Association can undoubtedly bring this about to a greater degree than herètofore. The occupational therapist has in many instances not had sufficient medical supervision and assistance. She has had to sell herself and her work without adequate recognition of the fact that she has a considerable contribution to make. Sales of articles, the byproducts of occupational therapy have done much to becloud true understanding of its purposes. An orthopedic surgeon has said, "Some devil discovered that what some patients made could be sold, and the therapeutic factor went by the board until better-trained therapists got it back into focus."

In the treatment of physical injuries in particular, the product must be minimized in favor of the exercise which is obtained by performing a specific activity. The therapist has learned to analyze occupations from the point of view of joint motion, muscle and nerve function. The patient must obtain a certain exercise, a certain motion must be performed a given number of times. The treatment needs to be applied with a considerable amount of scientific exactitude yet, at the same time, the patient's interest in what he is doing must be sufficiently absorbing so that his focus of attention is transferred from his disability to the project on which he is working.

Woodworking, metal work and printing have been the activities most commonly used in treatment of physical injuries. In many of our military hospitals, gardening, automobile mechanics, radio repair and similar masculine activities are being employed. The occupational therapist, because of her basic knowledge, can analyze any activity from the point of view of the motions required in its performance. An occupation, to be useful as exercise for a specific disability, must possess three major characteristics:

(1) It must afford repetition of the exact motion for an indefinite but controllable number of times;

(2) It must give action rather than position—grasping a tool tightly, for instance, maintains the fingers in a position of flexion but does not give the alternation of contraction and relaxation which constitutes true exercise;

(3) It must afford gradation in resistance, time and coördination. The weight of the work must be increased as the patient's strength increases, the period of work lengthens with recovery and finer motions are substituted for broader, larger ones as coördination improves. Occupations which do not

possess these three characteristics are of use only in special cases and are not broadly applicable to the treatment of physical injuries. It is, however, vitally necessary that the patient's treatment should be graded so that the activity which he performs becomes comparable in motion and weight with his actual job.

The treatment of amputees is one of the specialized fields developed by the war. It has been found that occupational therapy can be of great service in helping a man to become accustomed to the use of an appliance in teaching him to write and to perform normal, everyday acts which lose their simplicity when fingers and hand are gone. The mental adjustment to such disability is greatly helped by early instruction.

What we have said up to this point, refers in large measure to patients who recover from illness or injury with no serious after-effects and who may return to their previous occupations without definite handicap. The National Council on Rehabilitation defines rehabilitation as "the restoration of the handicapped to the fullest physical, mental, social, vocational and economic usefulness of which they are capable."

If, therefore, the prognosis of a patient's condition is bad or doubtful for his return to his previous occupation, plans must be made as early as possible to assist him in the necessary readjustment and to obtain adequate training for him in a field for which he is suited. Programs should be planned in conferences among the surgeon, the social worker, the occupational therapist and vocational training and rehabilitation officials.

In many instances training may be started while the patient is still in bed; diversional activities may become at the same time prevocational. Typing and shorthand, hand sewing, mechanical drawing, commercial art and many other projects may be taught. All sorts of educational work can be carried on through extension courses. There has been an interesting industrial project under the occupational therapy department at the U. S. Naval Hospital in St. Albans, New York. The men still in the hospital have learned assembly processes which keep them busily occupied, give them the necessary exercise for injured hands and arms and prepare them for actual jobs of similar type as soon as they are discharged. Such programs may be difficult to establish in civilian hospitals or workshops because of labor unions, but many activities of similar nature can be developed. The well trained occupational therapist by no means confines her work to the use of arts and crafts but seeks occupations which meet her patients' needs, be they mental, physical, social, vocational or economic.

Concepts of occupational therapy are changing rapidly. Heavy demands are being made upon therapists and upon the schools to meet the needs of our disabled service men and women. The challenge is great, the problems are many, but we believe that occupational therapists can meet them and that this type of treatment will become increasingly useful in restoring persons disabled by disease or injury to their inalienable rights to "life, liberty and the pursuit of happiness."

SUMMARY

The author, who is director of the Philadelphia School of Occupational Therapy, gives a brief history of the rise of occupational therapy as a profession, together with an outline of its present-day objectives. She explains the need for such work, in civilian as well as military hospitals, and points

out, with pertinent quotations, that the things a handicapped person is trained to do, need not always, by any means, be entirely useful in themselves. She looks forward to the day when the occupational therapist will no longer need to "sell" both herself and her work to an uncomprehending world.

SOMMAIRE

L'auteur, directrice du Philadelphia School of Occupational Therapy, nous donne un résumé de l'origine et des progrès de la thérapie d'occupation comme profession. Elle nous démontre l'utilité de cette spécialité non seulement dans les hôpitaux militaires mais aussi dans les hôpitaux civils. Elle nous indique ce qu'on enseigne aux mutilés, et aux invalides. Elle envisage le jour où les services des thérapeutes d'occupation seront appréciés et recherchés.

RESUMEN

El autor, que es Director de la Escuela de Terapéutica Ocupacional de Filadelfia, hace una breve historia de la evolución de la terapéutica ocupacional como profesión, y describe los objetivos actuales de dicha rama. Pone de manifiesto la necesidad de estos métodos de tratamiento tanto en la vida militar como en la civil y asegura, aduciendo al caso citas pertinentes, que las cosas en las que debe entrenarse una persona incapacitada, no tienen que ser necesariamente absolutamente útiles en sí mismas. Finalmente, expresa su deseo de que pronto la terapéutica ocupacional se imponga con rango definido a la atención de un mundo que, por el momento, no ha llegado a comprender esta rama científica en todo su valor.

Свод.

Автор, директорша Школы Трудовой Терапии в Филадельфии, дает краткую историю развития профессиональной трудовой терапии, а также дает очерк ее целей. Она объясняет нужду работы как в штатских, так и в военных больницах и указывает при помощи цитат, что вещи, которые больной учится делать, не должны быть полезными сами по себе. Она надеется, что придет день, когда не нужно будем убеждать непонимающий мир, как необходима эта работа.

(Continued from page 394)

Elle nous cite de chiffres donnés par la Maison Blanche en 1940, et aussi des observations du Selective Service. Elle nous indique la tâche qu'il incombe à chaque médecin afin atténuer certains maux signalés par ces deux communications. Dans une série de schemas, elle nous montre l'interdépendance entre causes et effets et les resultats qu'on peut obtenir en instituant les mesures qu'elle nous signale.

RESUMEN

El autor pone de relieva la gran resposabilidad que pesa sobre los hombres de profesiones ilustradas, especialmente la medicina, en lo relacionado a elevar el nivel standard de capacidad física y eugénica en los EE.UU., asi como también cabe a aquellos hombres la responsabilidad del presente bajo estado. Al particular cita las cifras dadas por la "Casa Blanca"

(Concluded on page 407)

The Classic Cesarean Section

DÉSIDERIO ALBINO ROMÁN, M.D., F.I.C.S.
Associate in Obstetrics and Associate Professor of Gynecology
PHILADELPHIA, PENNSYLVANIA

GENERAL CONSIDERATIONS

I DO not wish to give the impression that I have something new to offer on the subject of the classic cesarean section. Rather, it is my intention to emphasize the basic principles on which this form of intervention in surgical obstetrics depends.

One, two or even a dozen successful cesarean sections would afford but limited material for conclusive judgment, but a series of 53 sections within five years should yield admissible deductions and conclusions.

Historically, cesarean section did not have its origin in the birth of the great Emperor Julius, for it was known long before the Roman Empire, to the Egyptians and to the Babylonians, as a premortem as well as a postmortem practice, that is to say, in vivo as well as in an effort to save the child after the mother's death.

The presence of definite and clearcut indications, as well as the recognition of incontrovertible contraindications, determines the choice of section instead of the expectant process, with such minor surgical aids as may lessen the hazards of normal delivery.

With the aid of well organized aseptic technic, competent anesthesia, reasonable speed, etc., an otherwise needless cesarean section is by far a safer error than delay, hesitation and obscure judgment, which permit the engagement of the fetus in an impassable path, with fruitless effort and exhaustion of the mother's strength, and final adoption of desperate procedures and even mutilation, resulting in single or double sacrifice (mother and child).

Midwifery, the natural companion of motherhood in primitive days, served the purpose of its mission when the act of childbirth was practically sacred, consummated alone in the privacy of women, filled with artificiality in the absence of, and prior to, medical knowledge and understanding of the phenomena. In the present care by modern obstetricians, midwifery has been replaced by trained nursing and experience, void of the mysticism and religious practices of ancient times; but the role of the attendant nurse is in reality merely the refinement of the time-honored practical services of the midwife. The incidence of difficult labor and the deaths of both mother and child resulting from unnatural conditions inherent in the mother or due to malposition of the fetus, brought about the intervention of male help in search of a solution to the so-called dystocia and for the employment of instrumental aid in an effort to save mother and child.

The earlier practices, of course, brought about the employment of destructive procedures for extraction of the child, and these rudimentary as well as traumatic efforts in the days before asepsis often played havoc with the mother, resulting in death or in hazardous recovery.

HISTORICAL BACKGROUND

We are indebted, from the days of antiquity to the present time, to the gen-

Presented at the Ninth Annual Assembly of the United States Chapter of the International College of Surgeons, Philadelphia, Pa.

eral surgeons and anatomists who by their fundamental knowledge found the ways and means to intervene in nature's efforts and failures to the solution of the individual problems in any given case.

Among the contributors to the art and science of surgical obstetrics are Soranus and Rufus of Ephesus and, soon after these, Aetius, Celsus, Paul of Aegina, Avicenna, Albucasis, Rahzes and others through the Middle Ages, until the renaissance of the art was reached with Paré and Guillemeau, who perfected the management and modus operandi of podalic version.

As stated before, the term "cesarean section" suggests its origin in the birth of Caesar, but there is nothing to sustain such a hypothesis. The operation known as cesarean section was performed on dead mothers in an effort to save living children. Of interest, of course, is the reference to the technic carried out on living mothers, inconceivable nowadays, by abdominal section, emptying the uterus of child and after-birth, without closure of the uterine wound before the abdominal closure, with the natural result: death from hemorrhage and/or infection. Not until the procedure of closure of the wounds of both the uterus and the abdominal wall was brought into practice by Aetius and Porro did real progress result in the prevention of hemorrhage and infection and in the reduction of fatalities.

These historical references, necessarily brief, serve to show fundamental principles in the modern application of cesarean section as an intervention of choice, establishing the surgical procedure on a standard of efficiency.

GENERAL CONCLUSIONS

In a series of 53 consecutive cesarean sections performed by me over a period of five years (1939 to 1944) in my private practice and ward service, I have carefully analyzed not only the highlights governing my judgment in the selection of this form of intervention but every possible fact of functional or organic origin, as well as such historical information as appears characteristic or distinguishing in each individual case to fulfil the criteria demanded by a modern obstetric service. Prompt study and evaluation of the essential history of the case, painstaking physical examination and routine laboratory tests and check-ups, to determine the functional status, possible organic lesions, fluid balances, metabolic errors and even endocrine leads, will serve as positive or negative guides. Observation of cardiovascular phenomena, study of roentgenologic shadows and pelvimetry will complete a clinical survey of the highest importance and value in weighing the problem of dystocia diagnostically from a cephalopelvic standpoint.

When no urgency exists, nothing short of a competent diagnostic study in the minimum possible time will enable the obstetrician to reach a decision in anticipation of hazards or grave complications and to prepare his patient for safe anesthesia and a major surgical procedure under auspicious conditions.

On the other hand, when an emergency appears imminent, cardiovascular and cardiorenal conditions must be quickly determined, for loss of time increases the operative risk and the factors of success are in relative ratio definitely diminished.

No question exists that the classic cesarean section is a major surgical procedure, but in view of the standards of surgical technic and asepsis the trespass upon the abdominal cavity is by far a lesser injury than is entailed in efforts at delivery in the presence of obviously impassable obstacles, endan-

gering the life of both mother and child.

While the extraperitoneal cesarean procedure pursues the ideal of exclusion of intraperitoneal exposure in simplifying technic by feasible approach to the lower segment of the uterine body, the obstetric surgeon must be willing to risk much if he endeavors to use it generally. It cannot be denied that in certain cases it may prove to be the technic of choice and the results may be encouraging, but for routine employment it demands serious consideration, experience and the asumption of grave responsibility.

Again, may I say it is not my intent or purpose to enter the controversial boundaries as to the position of choice of the classic cesarean section in relation to other methods of approach, such as the lower segment cesarean or the extraperitoneal cesarean procedure and their numerous modifications.

My analysis and report of 53 classic cesarean sections in my own experience, with most fortunate results, does not imply that I give preference to this method of procedure to the exclusion of all others in vogue with many outstanding obstetric surgeons.

Twenty years in practical and surgical obstetrics and now as an associate in gynecology convince me of the urge and seriousness demanding mature experience, competent judgment and technic to warrant entering the pregnant uterus through the lower segment cesarean operation, with a transverse incision, as practiced by Monro Kerr and Marshall, or by any extraperitoneal route.

Endless possible complications arising from increased vascularity, retrovesical and retroperitoneal, with perhaps an anteriorly attached placenta, render the anterior lower segment of hazardous approach.

Surgical obstetrics and gynecology are interrelated, a complement one to the other, and no method of approach for surgical delivery can be held to be void of certain danger.

In this series of 53 classic cesarean sections with accurate report of facts and findings, with analyses and conclusions, I was fortunate enough, or had the "good luck," not to have a single maternal death directly following the delivery, except in one case in which the section was done because of placenta praevia centralis, complicated with decompensating heart disease, much against my judgment, but on the recommendation of the cardiologist and obstetric staff in consultation as the only procedure of choice in the emergency. Death occurred twenty-one days postoperatively, from a cardiopulmonary terminal syndrome, as revealed by autopsy. I may add, furthermore, that this was voted by the Maternity Mortality Committee of Philadelphia to be an unpreventable death.

There were only five premature fetal deaths, four resulting from abruptio placentae and one from prematurity with placenta praevia.

ROUTINE OPERATIVE TECHNIC

Under this heading, and to avoid repetition, I shall describe the routine operative procedure which is followed by my associates and me in all cases in which the classic cesarean section is chosen, except of course the surgical steps that may be taken in the event of unlooked-for conditions, when adequate and acceptable technical methods will be employed.

With the patient under general anesthesia (induced with nitrous oxide and oxygen, followed by ether), the abdomen is prepared locally with ether, 3.5 per cent iodine and alcohol. The abdomen is opened by an incision in the median line, hypogastrically (abdominopelvic

celiotomy), giving free exposure to the pelvic viscera. The incision is made layer by layer under complete hemostasis, by clamp and ligature, as required. The exposed uterus is now inspected, palpated, centralized and isolated by moist, large abdominal gauze pads. An incision is made in the uterine wall to correspond to the abdominal incision, exposing the membrane, which is punctured; the fetus is delivered by the feet, followed by the buttocks and the rest of the body and the head; the cord is divided between clamps, the placenta is delivered manually and massive bleeding is controlled by tampon pressure for a few moments.

The patient is given 1 ampule each of ergometrium and infundin and 1/6 grain (0.01 Gm.) of morphine sulfate. The uterine wound is then sutured layer by layer, with chromic no. 1 catgut for the subendometrial layer, chromic no. 2 for the muscular layer and chromic no. 1 for the serosa. The pelvic and abdominal cavities are thoroughly sponged, and a free portion of the omentum is drawn over the uterine line of sutures. All mops, abdominal pads, etc., are counted and the count verified correct before closure of the abdominal cavity is done, as follows: the peritoneum with plain no. 1 catgut, the bellies of the rectus muscles with plain no. 1, the muscular fascia with chromic no. 2, the superficial fascia and skin with retention sutures of no. 5 silk, and the skin edges with Michel clips. Alcohol gauze placed over the line of sutures and sterile dressings complete the operation. Drains or packs are not required.

STATISTICS ON 53 CLASSIC CESAREAN SECTIONS

34 of the mothers were private patients, 19 were ward patients. 41 were white and 12 were colored. Of the 19 ward patients, 12 were colored and 7 white.

Distribution According to Parity

Gravida	Para	No. of Patients	Ages, Years
I	0	35	15 to 40
II	I	11	22 to 39
III	II	3	21 to 35
V	IV	2	27 to 35
IX	VIII	1	37
XIII	XII	1	37

Types of Pelvis in 35 Mothers in First Pregnancy

Type	No.
Generally contracted	7
Relatively contracted	4
Moderately contracted	2
Simple flat (platypelloid)	6
Justo minor	1
Obliquely contracted	2
Funnel (android)	3
Normal	10

Reasons for Operation in 10 Cases of Normal Pelvis

	No. of Cases
Abruptio placentae	1
Placenta marginalis	1
Premature separation of placenta	1
Fetal dystocia	3
Organic heart disease	1
Chronic nephritis and hypertension	1
Uterine fibroid	1
Extensive perineum repairs	1

Types of Pelvis in 11 Mothers in Second Pregnancy

Type	No.
Normal (gynecoid)	4
Generally contracted	4
Relatively contracted	3

Reasons for Operation in 4 Cases of Normal Pelvis

	No. of Cases
Face presentation	1
Abruptio placentae	1
Chronic nephritis	1
Extensive perineal repairs	1

Types of Pelvis in 3 Mothers in Third Pregnancy

Type	No.
Generally contracted	2
Normal	1

Reasons for Operation in the 3 Cases

	No. of Cases
Fibroid complicating pregnancy at 7½ months	1
Heart disease with generally contracted pelvis	1
Cephalopelvic disproportion	1

Types of Pelvis in 2 Mothers in Fifth Pregnancy

Type	No.
Gynecoid	2

Reasons for Operation in the 2 Cases

	No. of Cases
Placenta praevia marginalis	1
Abruptio placentae	1

Type of Pelvis in 1 Mother in Ninth Pregnancy

Normal pelvis.

Reason for Operation:
Placenta praevia marginalis.

Type of Pelvis in 1 Mother in Thirteenth Pregnancy

Normal pelvis.

Reason for Operation:
Heart disease and placenta praevia (patient died).

Only one of the 53 mothers died. This was a woman with heart disease, whose thirteenth pregnancy was complicated by placenta praevia.

There were five deaths of fetuses, all of them due to placenta praevia or abruptio placentae.

The weights of the infants were as follows:

Weight, Pounds	No. of Infants
3 – 4	4
4 – 5	2
5	1
6 – 7	10
7½– 8	24
8½– 9	9
10 –11	3

The average period of hospitalization for the mothers was twelve days.

The following abnormalities other than pelvic deformities were noted:

Abnormality	No. of Patients
Previous cesarean sections	6*
Fibroids complicating pregnancy	2
Perineal repairs	2
Placenta praevia	3
Abruptio placentae	4
Heart disease	3
Toxemia	2
Chronic nephritis	2
Total	24

* Four white women and two negroes. One of the negroes had had two previous sections.

I have observed also from this series that complications arise more frequently in flat pelves than in normal pelves and that with flat pelves premature rupture of the membranes often occurs before the actual onset of labor.

Again, I have found that malpresentation, such as face, shoulder or breech, was more frequently encountered in flat pelves. My analysis also reveals that fetal dystocia was more common when there was a contracted pelvis in which the conjugata vera was 10 cm. or less or in which one diameter of the inlet or outlet was shortened 1 cm. or more, and when a growth (fibroid) occupied a portion of the pelvic canal.

I believe that the success of most high classic cesarean sections is based on the fact that they are performed a week or a few days before term or at the

beginning of labor, before rupture of the membranes or immediately thereafter, that is, when there is no danger of infection.

In my statistical studies of these cases, I find that the classic cesarean section was performed with greatest success in cases in which cardiac disease, uterine tumors and malpositions rendered vaginal delivery impossible, and in cases in which hysterectomy was indicated. In such cases the patients received vaginal instillations of 5 per cent solution of mercurochrome before operation.

I believe that patients who have been handled with uncertain aseptic technic or whose antepartum and laboratory studies have been inadequate should not be operated on by the classic cesarean section.

Above all, there should be no vaginal examinations when a classic cesarean section is contemplated, and rectal examinations should be very few, preferably one or two for determining engagement of the head, as performed by the method of Hilles and Mueller.

In contrast, low section is indicated when labor has been in process for some time and some complications have developed during labor, and when vaginal delivery has been tried and failed and classic section would involve too great a risk of infection.

I believe from my observations in these 53 cases of classic cesarean section that the anesthetic of choice is nitrous oxide, oxygen and ether. There were no complications from a respiratory standpoint, either to mother or child, from the use of this anesthetic.

The deaths of five of the 53 infants were due to prematurity as a result of complications with the placenta, namely, placenta praevia and abruptio placentae. The average weight of the babies seemed to be slightly above normal, and in a good many instances the diameter of the fetal head was above the normal.

SUMMARY AND CONCLUSIONS

While there are sufficient statistics incriminating the classical cesarean section because of the high percentage of deaths following operative procedures of this type, it may be of interest to note that in a period of four years I performed 53 classical cesarean sections without a single death due directly to the section; in one case death supervened twenty-one days postoperatively from a terminal cardiopulmonary syndrome. The statistics also show that I had no morbidity and that the average hospitalization time was twelve days. It is my firm belief that in antepartum care, together with a competent physical examination and laboratory studies, the incidence of infection is greatly reduced by proper management of the patient in preparation for a possible operative procedure.

It is my belief that cesarean section should be done as early in labor as possible, and that in all cases in which an elective cesarean operation has been decided on the operation should be performed within a week to a few days before the calculated date of confinement. When the fetus is unusually large, roentgenograms should be taken in the last month of pregnancy to rule out a monstrosity, since cesarean section is rarely justified when the child is abnormal.

In an analysis of these 53 cases from the standpoint of the type of pelvis, I noted that American-born white women had contracted pelves less frequently than foreign-born women, and that the rachitic type of pelvis was seldom seen in white women but was more commonly encountered in negroes. The generally

contracted pelvis was the most frequent type in this series, and a deformed pelvis due to spinal disease was next in frequency.

RÉSUMÉ

Nombreuses statiques reprochent à l'opération césarienne classique une haute mortalité. Dans les dernières quatre années, j'ai fait cette opération cinquante-trois fois et n'ai eu qu'un décès due l'opération même. Ce décès survint vingt-et-un jours après l'opération et fut dû a un syndrome cardiopulmonaire terminal. Il n'y eut dans mes cas aucune morbidité, et la durée moyenne du séjour à l'hôpital fut douze jours. Je suis convaincu qu'avec de bons soins durant la grossesse, et l'étude du malade et d'amples examens, physiques et de laboratoire, qu'on peut obtenir des résultats opératoires très satisfaisants.

L'opération de section césarienne devrait être faite au début du travail. Dans les cas ou la nécessité de l'opération à, été prévue durant la grossesse, on operera quelque jours avant la date calculée de la naissance. Si le fetus est de dimensions anormales, on prendra un roentgenogramme afin de s'assurer qu'on n'a pas affaire avec un monstre. La section césarienne n'est que rarement justifiable, si l'enfant est anormal.

Dans l'analyse de me 53 cas, j'ai observé que les femmes blanches de naissance Américaine sont moins sujettes à des anormalités pelviennes que les femmes d'origine étrangère j'ai aussi observé les pelvis rétrécis se rencontrent plus frequemment chez les negresses que chez les blanches. Les pelvis généralement rétrécis furent les plus nombreux dans ma série; après eux, nous rencontrâmes les pelvis contractes, due à des maladies de la colonne vertebrate.

(Additional foreign-language summaries of this material will appear in a later issue of the "JOURNAL.")

BIBLIOGRAPHY

Adair, Fred L. (editor): Obstetrics and Gynecology, by the Departmental Staff of the University of Chicago and Other Contributors, Philadelphia, Pa., Lea & Febiger, 1940, vols. 1 and 2, pp. 1000 and 1031.

Bland, Pascal B.: Gynecology, Medical and Surgical, Philadelphia, Pa., F. A. Davis Company, 1924.

Cantarow, Abraham, and Trumper, Max: Clinical Biochemistry, ed. 2, Philadelphia, Pa., and London, England, W. B. Saunders Company, 1939.

Davis, Carl Henry (editor): Gynecology and Obstetrics, Hagerstown, Md., W. F. Prior Company, Inc., 1933.

De Lee, Joseph B.: The Principles and Practice of Obstetrics, ed. 6, Philadelphia, Pa., and London, England, W. B. Saunders Company, 1933.

Dieckmann, William J.: The Toxemias of Pregnancy, St. Louis, Mo., C. V. Mosby Company, 1941.

Engelmann, G. J.: Labor Among Primitive Peoples, Showing the Development of the Obstetric Science of Today From the Natural and Instructive Customs of All Races, Civilized and Savage, Past and Present, ed. 2, St. Louis, Mo., J. H. Chambers & Co., 1883.

Greenhill, J. P.: Obstetrics in General Practice, Chicago, Ill., Year Book Publishers, Inc., 1940.

Harper, Paul T.: Clinical Obstetrics, Philadelphia, Pa., F. A. Davis Company, 1930.

Litzenberg, J. C.: Synopsis of Obstetrics, ed. 2, St. Louis, Mo., C. V. Mosby Company, 1943.

Lusk, William T.: The Science and Art of Midwifery, ed. 4, New York, N. Y., D. Appleton and Company, 1892.

Martius, Heinrich: Gynecologic Operations and Their Topographic-Anatomic Fundamentals, authorized English translation under the editorial supervision of W. A. Newman Dorland, Chicago, Ill., S. B. Debour, Publishers, 1939.

Novak, Emil: Gynecological and Obstetrical Pathology with Clinical and Endocrine Relations, Philadelphia, Pa., W. B. Saunders Company, 1940.

Quarterly Review of Obstetrics and Gynecology, published quarterly by Washington Institute of Medicine, Washington, D. C.

Ricci, J. V., and Marr, J. P.: Principles of Extraperitoneal Caesarean Section, Philadelphia, Pa., The Blakiston Company, 1942.

Williams, J. W.: Obstetrics: A Textbook for the Use of Students and Practitioners, ed. 8, a revision and enlargement by Henricus J. Stander, New York, N. Y., D. Appleton-Century Company, 1941.

Titus, Paul: The Management of Obstetrical Difficulties, St. Louis, Mo., C. V. Mosby Company, 1937.

DARIO FERNANDEZ FIERRO, M.D., F.I.C.S.

It was with much sorrow that the friends and admirers of Don Fernandez Fierro, of Mexico City, learned of his death on March 12th, last, following a long and painful illness.

"Master Dario," as he was familiarly called, was an Honorary Fellow of the International College of Surgeons, a long-time member of its International Board of Trustees, and Vice-President of the Mexican Chapter of the College. He was also widely known as one of the most important medical men of the Mexican Republic, a brilliant surgeon and beloved and inspiring teacher. He was associated, as professor, for some years, with the Faculty of Medicine of the National Free University of Mexico (La Facultad de Medicina de la Universidad Nacional Autonoma de Mexico).

Members of the medical profession everywhere, and more especially the Fellows and Members of the International College of Surgeons throughout the world, join those who have personally known and worked with Professor Fierro, in mourning the irreparable loss suffered by Hispanic America in the death of this fine man. His life was exemplary, his character as modest and unassuming as it was honest and straight-forward. We will not soon again find his equal.

(Continued from page 399)

y por el Servicio Selectivo. A continuación analiza los pasos que cada médico en particular debe dar para contribuir a aliviar, inmediatamente, algunos de los males que las dos instituciones citadas han presentado al publico en sus comunicados. En una serie de cuadros ilustrativos muestra el autor las interdependencias entre causa y efecto y expone los resultados a obtener siguiendo las medidas que propone.

Свод.

Автор заявляет, что на ученые профессии, вообще, а в особенности на медицину, падает большая ответственность не только за поднятие физических норм американской жизни, но также и за их теперешний низкий уровень. Он цитирует цифры доклада Белого Дома в 1940, а также наблюдения призывного отдела. Он затем излагает некоторые шаги, которые могут быть предприняты индивидуально каждым врачем сейчас же и на месте, а также указывает некоторые недостатки, найденные этими двумя агентствами. В серии таблиц он показывает различные взаимоотношения между причиной и эффектом и возможные результаты рекомендуемых им мер.

REFERENCES

1. Bailey, Hamilton: Surgery of Modern Warfare. Williams & Wilkins, Baltimore, 1944. Chap. XXXII.
2. Koerner, A.: Male Sterility After the War. M. Rec., p. 99 (Feb.) 1944.

NEW BOOKS

In the preface to this latest edition of the standard **Textbook of Obstetrics,**[1] **Dr. Henricus J. Stander** says, "this textbook, designed for the use of both the medical student and the practitioner" attempts to present "the science and art of obstetrics as taught in the Cornell University Medical College and practised in the New York Lying-In Hospital. Scientific and clinical data are given throughout the text, as these must of necessity be part of an academic as well as adequate presentation of the subject matter. The great majority of the teachers of obstetrics asked me to follow this plan, while only a few advised 'stream-lining.' For those who wish to concentrate in their teaching and reading on the more practical aspects, these are in larger type, while the historical and a great deal of the theoretical considerations appear in small type.

"It is also partly on the advice of my colleagues and teachers of obstetrics, many of them trained by Williams, that a change has been made in the title-page." This book, then "embodies the teaching and practice of the present author," quite as much as the form and idea of its originator, **Dr. J. Whitridge Williams.**

In its several editions, this has been the standard text on this subject since 1903. It is large enough (1277 pages) to cover completely every phase, not only of what might be considered strictly obstetrics *per se,* but also everything related to conception, gestation, partuition and post-partum care, as well as embiology, hystology and all of the abnormalities and complications that may be more or less frequently encountered.

Illustrations are very numerous and of all kinds, according to need. They are large, clear and well reproduced. Especially good, are the groups of line-drawings representing the position of the fetus during various stages of labor, from each of the recognized possible pre-natal positions. Also noteworthy is the use of half-tone drawings in preference to photographs in many instances, where the latter would give insufficient detail and information. References and bibliography are most extensive, arranged in groups throughout the book, adjacent to the related text material. The book itself, in spite of its size and weight, is easy to use, due to clear, large type (even in the smaller size used for historic and theoretical material) and a binding which allows it to lie open flat.

The Care of the Neurosurgical Patient Before, During and After Operation,[2] by **Dr. Ernest Sachs,** is dedicated to the neurological Fellows whom he has taught.

This textbook is most opportune at this time, because many young surgeons returning from the armed forces, who have had some experience in traumatic surgery about the head and neck may have gained the impression that they are finished neurologic surgeons. The details entered into in this textbook are not only valuable to the young neurologic surgeon but of interest and value to the experienced one as well. Since the information in this text is based on personal experience, this in itself is a valuable contribution to the subject. The textbook is profusely illustrated by drawings and contains detailed case histories, including subsequent treatment, operative procedures and preoperative and postoperative care.

If the reader bears in mind that this is a book purely relating to the *care* of the neurosurgical patient, he will not be disappointed in the text. If, on the other hand, he expects to learn or get a comprehensive knowledge of neurologic surgery, he will have a bitter disappointment. The book is, nevertheless, unhesitatingly recommended as a valuable adjunct to the library of any man who is interested in neurosurgical conditions and allied subjects.

---

[1] Textbook of Obstetrics; Designed for the Use of Students and Practitioners. Henricus J. Stander, M.D., F.A.C.S. Stander's Third Revision; Ninth Edition of *Williams Obstetrics* by the late J. Whitridge Williams, M.D. D. Appleton-Century Co., Inc., New York; 1945.

[2] The Care of the Neurosurgical Patient Before, During and After Operation. Ernest Sachs, M.D., F.A.C.S. C. V. Mosby Co., St. Louis, Missouri; 1945.

Prof. Truchaud's new book (French text) on **War Surgery**[3] is a most valuable contribution to war and industrial surgery. It is a clear presentation of the subject; no space is wasted in useless descriptions. Several other French surgeons have collaborated on this work, all masters of the subject of which they write. The subject matter has been thoughtfully brought up to date, making this an authoritative text of great interest to clinicians and surgeons, military, naval and industrial.

It is refreshing to find so much stress laid upon the important details of treatment. Several chapters are devoted to the general pathology, symptomatology, and diagnosis and treatment of fractures, articular, juxta-articular and diaphyseal. Others cover almost everything of importance in the treatment of gunshot wounds. The concluding chapters discuss the pathology, symptomatology and treatment of wounds to the nerves, vessels and viscera.

In all these chapters, the surgical, orthopedic, electrical and mechanical management of these various conditions are discussed in detail. The book contains many illustrations, helpful to a busy operating surgeon and contributing to the full understanding of the text.

The author warns against the use of strong antiseptics in wounds; they annihilate the natural defenses of the tissues and are more dangerous than useful and devitalize the tissues. He is not in favor of constant irrigation of wounds with antiseptics; it is far better, he says, to utilize isotonic solutions that favor the natural defenses, or hypertonic solutions may be used to provide transudation. He advises immobilization of wounded extremities and the avoidance of frequent dressings. He advocates free drainage in gunshot wounds and removal of projectiles.

Biologic resistance of osseous tissue is nonexistent. Immobilize all wounded tissues during the period of congestion, edema and cellular proliferation. The author states that war wounds are not aseptic wounds; they are usually accompanied by great trauma to muscular tissue; if the bone has been penetrated, much splintering may be present. The employment and value of the sulfa drugs is discussed at length.

This book may be recommended without hesitation as one of the best published on the subject. It is complete, well arranged, clearly written, up to date and amply illustrated.

Decidedly a step in a much-needed direction is the series of monographs being produced by the Bellman company to assist vocational counsellors and others interested in the newer guidance activities. The field of occupations covered by the monographs listed is wide indeed, ranging all the way from library work (No. 1), religion (No. 18) and pharmacy (No. 51) at the one end, to agriculture (No. 11), cartography (No. 60) and Girl Scouting (No. 57) at the other. Each is written by an authority in the particular field.

The present work on **Physiotherapy**[4] by **Dr. Thomas Hennessey** covers, in only seventeen pages, all of the essential information needed by anyone considering entry into the field of physiotherapy as a lifework. All facets of the subject are touched upon, from the early history, dating from prehistoric times, to development through two World Wars, opportunities open to either graduate physicians or technicians and the remuneration to be expected by each, the personal qualifications required, extent and cost of necessary preliminary education, advantages and disadvantages, and lists of associations and periodicals.

The author brings to his subject the products of a long life of experience with the work about which he writes, having gained his knowledge of physiotherapy as he says "by trial and error (with) the instruments available" in the days before it had become the fairly exact science it now is. He is more than competent to speak with authority.

The text is clear and concise, arranged in labeled paragraphs for easy reference. The only shortcoming apparent, if such it is, would be too large a proportion of the very limited space given to history, which, while unquestionably interesting, is not absolutely essential.

---

[3] Chirurgie de Guerre. Colonel H. Truchaud, Prof. of Clinical Surgery, School of Medicine of Angers. Les Lettres Françaises, Beyrouth.

[4] Physiotherapy. (No. 65 of the Vocational and Professional Monographs Series.) Thomas Francis Hennessey, M.D. Bellman Publishing Co., Inc., Boston, Mass.; 1946. Price, 75 cents.

The surgeon who amputates an extremity must be prepared to assume responsibility not only for the surgery, but also for rehabilitation of the patient to as close to a normal existence as possible. This entails a thorough knowledge of the art and science of prosthetics.

In **Amputation Prosthetics,**[5] by **Dr. Atha Thomas** and **Mr. Chester C. Haddan,** orthopedic surgeon and limb manufacturer have combined their knowledge and efforts in producing an excellent volume dealing with every phase of amputation, prosthesis and rehabilitation. With basic anatomical and physiological principles in mind, the authors describe exactly at which levels amputations should be performed so as to achieve greatest efficiency in the use of prostheses. Postoperative care, complications and stump hygiene are presented clearly and concisely. The fitting, alignment and construction of prostheses are rationally explained in terms of the mechanics of normal locomotion and joint function. Emphasis is placed on the importance of constant coöperation between surgeon and limb maker.

The chapter dealing with amputation prosthesis in children is especially constructive. Too many children are permitted to go through life badly crippled by congenital abnormalities, poliomyelitis or chronic osteomyelitis, when amputation and prostheses would enable them to lead far more useful existences with much happier psychological adjustments.

A review is given of the various voluntary and governmental agencies for the rehabilitation of the physically handicapped.

The book is well written and profusely illustrated. It should be read by every surgeon and limb maker, for only by a thorough understanding of each others' problems can amputation prosthesis be maintained at the highest possible level of usefulness.

The late **Dr. Fred H. Albee** and his associates, have presented, in their **Surgery of the Spinal Column,**[6] a very timely epitome on the entitled subject. The chapters on the "History of Spinal Surgery," "Anatomy of the Spine," "Static Deformities of the Spine," "Low Back Pain and Infections of the Low Back," and especially the chapter on "Tuberculosis of the Spine," are filled with material concisely and effectively arranged. Since the discovery of the significance of the herniated intervertebral disk, spinal surgery has doubled or trebled in its importance. The authors have recognized this fact and have supplied a much-needed review on the entire subject.

In this volume, **Esther Parsons** strives to answer the oft-repeated question, "How can I best serve the doctor and his patients?" Receptionists, medical secretaries, nurses and laboratory technicians who work **In the Doctor's Office,**[7] will find this volume a very excellent handbook.

Miss Parsons' most important aim is to acquaint the medical assistant with how she may increase her personal efficiency and thereby make herself as profficient and as nearly invaluable in her vocation as possible. The author, herself a former medical assistant and teacher of assistants, from her many years of valuable, practical experience, draws a perfect pen picture of this highly specialized field. It is to the point, yet offers a complete and thorough study of the subject under discussion. The reader will find the material has been gleaned from lectures, from experience and from suggestions contributed by doctors. This helpful book should be not only read, but reread often.

---

[5] Amputation Prosthesis. Atha Thomas, M.D., F.A.C.S. [Associate Professor of Surgery (Orthopedics), University of Colorado School of Medicine] and Chester C. Haddan (President of the Association of Limb Manufacturers of America). 207 Illustrations. J. B. Lippincott Company, Philadelphia, Pennsylvania; 1945. Price, $8.00.

[6] Surgery of the Spinal Column. Fred H. Albee, M.D., F.A.C.S., F.I.C.S., Earl J. Powers, M.D., F.I.C.S., and Lt. Col. Harold C. McDowell. F. A. Davis Co., Philadelphia, Pennsylvania; 1945. 229 illustrations. Price, $8.00.

[7] In the Doctor's Office, the Art of Being a Medical Assistant. Esther Jane Parsons, J. B. Lippincott Co., Philadelphia, Pennsylvania; 1945. Price $2.00.

COLLEGE INTERNATIONAL DE CHIRURGIENS

ROBES FOR MEMBERS AND FELLOWS

The Surgeon's robe is the closed Geneva style with bell sleeves and inner sleeves. The color is ruby wine with medicine green and science gold colors in the velvet facing, and royal blue chevron bars on the bell sleeves.

Fellows are privileged to wear the hood. The hood is the Doctor's style with medicine green velvet. The field is maroon, and the chevron contains the official colors of the University that conferred the Doctor's degree. The cap matches the gown, and has a medicine green hat band and gold tassel.

All outfits are made to order to individual measurements. The cap, gown and hood costs $75.00, the cap and gown, $59.50. Payment is to accompany the order.

An order placed now for the Cap, Gown and Hood will assure delivery in time for the Convocation at the Eleventh National Assembly of the United States Chapter, Detroit, Mich., October 20–23, 1946.

OFFICIAL OUTFITTERS FOR I. C. S.

Write for catalogue and measurement chart

McCARTHY & SIMON, Inc.

7-9 West 36th Street New York 18, N. Y., U.S.A.

COLLEGE INSIGNIA KEYS READY FOR DISTRIBUTION

The *College Insignia Keys* which have been approved by the International Board of Trustees and by the Executive Council of the United States Chapter (see illustrations) are ready for distribution.

Matriculates may use the base metal key (the price of which is $2.75); *Affiliates,* the bronze key ($3.00); *Associates,* the sterling silver key ($4.00); *Fellows,* the solid 14 karat gold key ($18.00). Distinctive keys for *national* and *international officers* are available; descriptions and prices will be furnished upon request. Federal tax additional.

NOTE: When a surgeon is advanced from a lower to a higher rank in the College, he shall return the respective key to the official jeweler before receiving his new key.

BOYDEN-MINUTH COMPANY

Official Jewelers

Room 1314, Heyworth Bldg., 29 East Madison Street, Chicago, Illinois

Sección en Español

Micrognatismo - Protesis de Paladón

ERNESTO F. MALBEC, M.D., F.I.C.S.*
BUENOS AIRES, ARGENTINA

EL paciente que motiva la presente comunicación, a causa de un micrognatismo, fué operado en el Hospital Ramos Mejía, en la cátedra del profesor Alejandro Ceballos.

Su atrofia del maxilar provenía de una anquílosis témporomaxilar doble, adquirida en su infancia. Con el objeto de corregir semejante anomalía, a los tres años, el profesor Manuel Ruíz Moreno lo sometió, con éxito, a una intervención quirúrgica. Actualmente, tiene veintidós años.

Los trastornos de las articulaciones dentarias, no lo molestan, ni lo preocupan mayormente. No se puede decir lo mismo, en cambio, de lo referente a su aspecto estético, que ha suscitado en él una profunda alteración psíquica. Se siente tan disminnuído por la deformación de su semblante, que ofrece la clásica expresión de perfil de pájaro, que ha llegado insensiblemente a contraer un sentimiento de inferioridad muy acentuado. El enfermo, ahora, reclama imperiosamente una corrección inmediata.

En este caso se pueden practicar diversas operaciones, todas con idéntico fin. A saber: *(a)* Sobre el maxilar inferior, ya sea a nivel de la línea media, paramedia u horizontal, mediante osteotomías verticales, horizontales, oblicuas o en escalera, para modificar su longitud y su forma, o sobre la articulación témporomaxilar a fin de obtener un desplazamiento anterior; *(b)* Sobre las partes blandas, colocando un injerto o una prótesis.

Fig. 1. Paciente visto de frente, antes y después de operado. (Fotografía tomada a los cinco meses de efectuada la operación.)

Con la primera intervención se trata de conseguir un mejoramiento funcional y estético, mientras que con la segunda se procura tan sólo corregir la forma, independientemente de la función. Por supuesto, esta última operación, es relativamente fácil. A la edad en que se toma al paciente, además, resulta inaplicable todo tratamiento ortodóncico, con el cual se obtienen resultados magníficos durante la infancia.

En atención a que nuestro paciente requería solamente la corrección de su defecto estético, resolvimos colocarle una substancia de relleno. Había que elegir entre un injerto o una prótesis.

* Profesor libre de la Facultad de Medicina de La Plata.

El injerto, ya sea de hueso o de cartílago, casi siempre se vitaliza, incorporándose al organismo. O lo que es igual: se tolera. Pero, frecuentemente, modifica su forma y reduce sú tamaño. Esto, en el mejor de los casos, supuesto

Fig. 2. Paciente visto de perfil antes y después de operado.

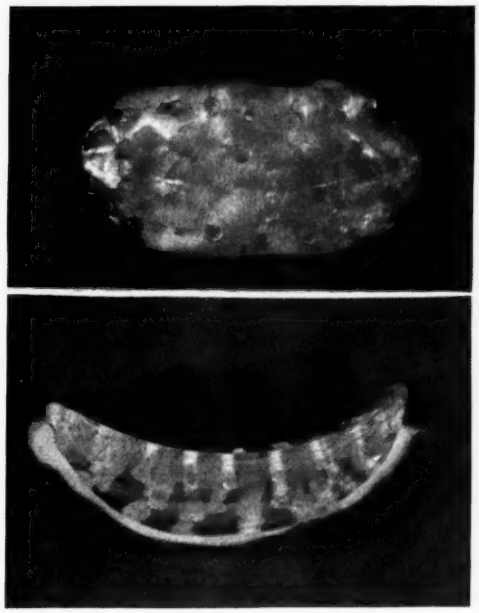
que hemos tenido oportunidad de presenciar reabsorciones parciales unas veces, y otras veces, reabsorciones totales y enrulamientos, empero, sin proceso de infección alguna.

Cuando sobreviene la supuración, no obstante, el injerto, por lo general, se elimina completamente, dejando como corolario un resultado deplorable. Nos referimos, claro está, a los autoinjertos únicamente, dado que los héteroinjertos fueron descartados por nosotros, en tanto que los homoinjertos fracasan normalmente.

Entre las substancias protésicas, utilizamos diferentes materiales. Unos orgánicos y otros inorgánicos. Hueso de vaca desecado, marfil, aluminio, duraluminio, paladón, vitalón, dencene, neopaladón, y, últimamente, tántalo.

El paladón fué empleado en doce casos, incluyendo el presente. Entre ellos figuran, también, nueve rinoplastias y un hundimiento de cráneo con destrucción del reborde orbitario.

El primer enfermo fué intervenido el 27 de marzo del año 1941, y el último, el 3 de enero del año en curso. Tuvimos dos casos en que hubo eliminación. Uno, debido a un defecto de técnica. Sucedió que la prótesis, a pesar de habernos parecido demasiado grande en el momento de la operación, no fué rectificada oportunamente. Otro, intervenido el 17 de marzo de 1942, se trataba, en cambio, de una prótesis colocada en una nariz en silla de montar, que se expulsó, luego de una tolerancia absoluta, con un rui-



Figs. 3 y 4. Prótesis de paladón vista de frente y de perfil. Obsérvense en ella las perforaciones hechas con el objeto de fijarla y disminuir su peso.

doso proceso inflamatorio, casi tres años después, el 4 de febrero de 1945.

Al enfermo actual, como dijimos, optamos por aplicarle una substancia de relleno, eligiendo el paladón, que según se sabe, es una resina sintética metilacrílica, altamente tolerada por el organismo, y que dispone, asimismo, de

otras propiedades dignas de ser mencionadas, como:

(a) Dureza muy grande, lo cual lo hace casi inquebrantable en su utilización, y cierta elasticidad muy conveniente.

(b) Es muy liviano. Esta condición es, podríamos decir, verdaderamente excepcional, pues resulta un sesenta por ciento más liviano que el marfil y un cuarenta que el caucho, ofreciendo las mismas ventajas si se lo compara con el aluminio, con el duraluminio o con el dentalio.

(c) No se deforma, ni muestra la tendencia a recuperar su forma primitiva, cosa que ocurre casi siempre con la mayoría de las substancias termoplásticas.

(d) Su preparación es de una simplicidad tan concluyente que no exige aparatos especiales para su modelado.

(e) No experimenta ninguna variación con la modificación de la temperatura ambiente.

(f) Presenta una resistencia absoluta a los álcalis y a los ácidos.

(g) No absorbe los líquidos orgánicos.

(h) Se esteriliza fácilmente mediante componentes químicos, tales como alcohol, sagrotán o merthiolate. Basta para ello sumergirlo unos cuantos minutos.

Todas estas propiedades del paladón, son, más o menos, las mismas del vitalón y del dencene. Ahora bien: ?cómo se prepara la prótesis? Muy sencillamente. Aunque nosotros, ordinariamente, enviamos el material a un técnico para que proceda a su preparación, vamos a indicar, en forma rápida, cuál es el procedimiento que se sigue.

Originariamente, la substancia, viene compuesta en dos partes. Una líquida y otra en polvo. Se debe, en consecuencia, mezclar las dos, a fin de obtener con ellas una pasta. De acuerdo al volumen de la prótesis que se desea modelar, se coloca en un recipiente de vidrio la cantidad adecuada de polvo. Luego, con cuentagotas, se agrega lentamente el líquido hasta lograr la saturación. Se procede, en seguida, a tapar el recipiente con una plancha de vidrio, al objeto de impedir la evaporación, aguardando, mientras tanto, treinta minutos. Después, con una espátula, se hace la mezcla, bien homogénea, cosa que se consigue con suma rapidez. La preparación está a punto cuando se pega o se queda adherida al cristal. Entonces, se toma con las manos y se amasa como si fuese masilla, evitando las presiones violentas, para impedir la eliminación del líquido necesario.

Como se ha dicho anteriormente, para la reproducción de la parte a operar, el mejor elemento es el yeso por su exactitud, lo que facilita la preparación de un modelo de cera, el que es colocado en una mufla dental y revestido de yeso y de estaño. Después, se hierve la mufla en agua caliente, a fin de conseguir, de este modo, la cavidad libre de cera que se rellena y prensa con la pasta obtenida en la manipulación descrita. La mufla tiene que ser prensada primero y más tarde hervida durante cuarenta minutos. Así, se consigue el endurecimiento de la pieza, la que una vez pulida queda lista para los fines de su empleo.

Tal cual puede verse en las figuras que ilustran este artículo, la prótesis es la réplica justa del defecto. Es de tamaño considerable, adaptándose perfectamente al mentón atrófico y a las ramas horizontales del maxilar. Se encuentra perforada en varias partes.

?Con qué objeto practicamos tales perforaciones?

1º. Para hacer más liviana la prótesis, reduciendo su escaso peso en un porcentaje apreciable.

2º. Para permitir el paso a través de dichos orificios de tejido neoformado con vasos y asegurar la vitalidad de la cubierta cutánea que reposa sobre la prótesis. Si no se procediese así, se podría producir, por isquemia, una ulceración por decúbito con la infección del lecho y la expulsión correspondiente de la substancia de relleno.

3º. Porque estos mismos tractus fibrosos, que van de la cara profunda de la piel al plano esquelético, a través de los orificios, fijan la pieza, impidiendo que ella efectúe desplazamientos inconvenientes.

La operación de nuestro paciente fué llevada a cabo el 3 de enero del año que corre. Se practicó una incisión transversal de cinco centímetros, a nivel del surco profundo retromentoniano. Se seccionaron las bridas de tejido fibroso que unían la cara profunda de la piel con la aponeurosis superior por una parte, y con el periostio por la otra. Con la tijera de Mayo se liberó el colgajo superior y el colgajo inferior. Luego, se labró un túnel hacia cada uno do los lados, siendo entonces posible colocar la prótesis. Afrontamiento del tejido celular con catgut 000 y sutura de la piel con dermal 00000. Apósito graso e inmovilización con un buen vendaje de telas adhesivas. A los diez días, se retiran los puntos. Han transcurrido ya varios meses. El resultado lo dejan ver las fotografías. No olvidemos, sin embargo, que el paladón es una substancia inorgánica. O sea: extraña al organismo. Y que a pesar de su tolerancia probada, tanto por nosotros como otros cirujanos plásticos, en cualquier momento puede ser eliminada por el cuerpo.

La Misión Médica Mejicana

UNA misión universitaria mejicana constituida por los eminentes cirujanos profesores Manuel A. Manzanilla, Miguel López Esnaurrízar y Francisco Fonseca, de la Universidad Autónoma de Méjico, ha recorrido, en viaje cultural, diversos países de las Américas, llevando a todos ellos, con sus autorizadas voces, el estandarte de la ciencia médica de la gran república hispano-americana del norte.

La personalidad destacadísima de estos tres ilustres profesores ha sirvido, una vez más, de lazo de unión entre los diferentes movimientos científicos de nuestro Continente, aportando con su esfuerzo individual nuevos y valiosos factores que habrán de pesar, seguramente, creando un más estrecho acercamiento entre los hombres de ciencia y las Instituciones de todos los países de habla española.

Orgullosos estamos de que estos misioneros culturales sean miembros prestigiosos del Colegio Internacional de Cirujanos; con ellos el nombre de nuestra Organización se abrillanta y a través de ellos el Colegio ha enviado su mensaje de cordialidad a todos los médicos de Hispano-América. Creemos sinceramente que nada acrecienta más el afecto común como el mutuo conocimiento. "Conocerse es quererse", dice un antiguo adagio y así estimamos que ésta misión de los universitarios mejicanos, llevando muy alto no sólo el nombre de Méjico sino tambien el del Colegio Internacional de Cirujanos, ha servido para estrechar los ya recios

lazos que nos unen con la clase médica de la América Latina.

Los tres hombres de ciencia que, desde octubre pasado a enero de éste año, han visitado Guatemala, Brasil, Uruguay, Argentina, Chile, Bolivia, Perú y Venezuela, tienen sobrados títulos para merecer justificadamente los homenajes con que se les ha agasajado en todos estos países. El Profesor Manzanilla es Miembro Honorario y Vice-Presidente Internacional del Colegio Internacional de Cirujanos, Profesor y Consejero Técnico de la Facultad de Medicina de México, Miembro de la Academia Mejicana de Cirugía, de la Academia Nacional de Ciencias de la Habana, Cuba, de la Sociedad Internacional de Cirugía, de la Sociedad Internacional de Gastroenterología y de diversas otras instituciones científicas de prestigio mundial.

El doctor López Esnaurrízar es tambien Miembro Honorario del Colegio Internacional de Cirujanos, Regente del Capítulo Mejicano de dicho Colegio, Miembro de la Academia Mejicana de Cirugía, de la Sociedad Internacional Gestroenterología y Profesor de la Facultad de Medicina de su país, siendo, ademas, un brillante escritor a cuya pluma ilustre se debe el breviario moral que lleva por título "Siguiendo la Senda de Esculapio".

El doctor Fonseca García es asimismo Miembro Honorario, Regente y Secretario del Capítulo Mejicano del Colegio Internacional de Cirujanos, siendo, por otra parte, Profesor de la Facultad de Medicina de Mejico y Miembro de la Academia Mejicana de Cirugía. Como sus otros dos colegas ha sido y sigue siendo infatigable y valioso impulsor de nuestra Organización, guiado por el único interés de fomentar el adelanto e intercambio de los conocimientos quirúrgicos entre todos los países.

La vocación del deber ha alentado a estos hombres en su árdua tarea de aliviar el dolor de los privados de salud y en su sacerdocio de enseñar a las nuevas generaciones el arte de curar. Consolando a los unos y mostrando la verdad a los ostros han dado estos hombres plena justificación a sus vidas. Vidas ejemplares que sirven de pauta a los jóvenes que entran en la senda de Hipocrates dispuestos a dar, como aquellos, sus frutos y su savia para alimentar con ellos el venero de la Ciencia, que por tal virtud mana como cantera inagotable. DR. M. M.

Noticias y Anuncios

La Misión Médica Mejicana.—Como hemos apuntado en una de nuestras Editoriales, una misión médica mejicana compuesta de los Profesores Manuel A. Manzanilla, Miguel López Esnaurrízar y Francisco Fonseca ha recorrido, en viaje cultural, diversos países de Hispano-América: Guatemala, Brasil, Uruguay, Argentina, Chile, Bolivia, Perú y Venezuela. El vieje se prolongó desde octubre pasado a enero del presente año. A su llegada a Guatemala los ilustres viajeros fueron recibidos en el Paraninfo de la Universidad de San Carlos por el Rector Dr. Martinez Duran, donde se les hizo entrega de los Diplomas nombrándolos Profesores Honorarios da la Universidad. En ese país los tres médicos mejicanos pronunciaron interesantes conferencias.

En el Brasil, la Academia Nacional de Medicina de Rio, bajo la presidencia del Dr. Austregesilo, celebró una sesión solemne en honor de los distinguidos visitantes, pronunciándose discursos que fueron contestados por el jefe de la Misión quien hizo alusión al movimiento científico en América comenzado, precisomente, en Méjico donde se fundó el primer hospital, la primera escuela de medicina y la primera asociación médica. Visitaron, los médicos aztecas diferentes instituciones científicas y fueron objeto de varios homenajes entre ellos el ofrecido por la Sociedad Médica de San Lucas en colaboración con la Asociación Paulista de Medicina.

En Montevideo, Uruguay, fueron objeto también de diversos agasajos por parte de las autoridades médicas y universitarias.

En la Argentina fueron recibidos por el Rector de la Universidad de Buenos Aires y visitaron las instituciones médico-quirúrgicas de Córdoba. Dieron conferencias en el Instituto de Clínica Quirúrgica y de Medicina Experimental. En el aerodromo de Cerrillos en Santiago de Chile fueron recibidos por los Drs. Vargas Salcedo, Aldo Contrucci, secretario de la Facultad de Medicina, y Enrique Raventos, secretario de la Liga Chilena contra el Cáncer. El Consejo de la Universidad les dedicó un acto académico en el cual el Rector pronunció un discurso de bienvenida al que contestó el Dr. Manzanilla. En este acto, los médicos de la misión mejicana presentaron sus credenciales. La Sociedad Chilena de Cirugía celebró en honor de los insignes visitantes otro acto en el cual el Dr. Esnaurrizar habló sobre "injertos osporum y su aplicación a la Cirugía, estudiándose el concepto biológico de estos transplantes; el Profesor Manzanilla disertó sobre las modificaciones de la reserva alcalina en los climas de altura y su aplicación quirúrgica y, finalmente, el Dr. Fonseca explicó las complicaciones quirúrgicas de las brucelosis, enfermedad frecuente en Méjico.

En Bolivia hubo una recepción en la Universidad de la Paz, haciendo la presentación de los delegados científicos mejicanos el Dr. Enrique St. Loup, Presidente del Capítulo Boliviano del Colegio Internacional de Cirujanos, que habló sobre la tradición científica de Méjico y condujo a los visitantes ante el Estrado de la Universidad Mayor de San Andrés. Luego ocupó la tribuna el Dr. Manzanilla quien, aludiendo al discurso del Dr. Loup, recordó como el propio Hernan Cortés funda el primer Hospital para Indios.

En Lima, en la antigua Universidad de San Marcos, se celebró una ceremonia especial presidida por el Rector Dr. Carlos Monge en cuya reunión el Dr. Manzanilla presentó las credenciales y pronunció brillantes frases a las que constestó el Rector Dr. Monge.

En todas partes los eminentes misioneros científicos mejicanos fueron objeto de grandes manifestaciones de simpatía y afecto, que han servido sin duda para hacer más intimo el estrechamiento cultural y científico entre los diferentes países del Continente.

Felicitamos muy sinceramente los tres colegas mejicanos por su brillante labor y nos felicitamos por el hecho de que los tres sean miembros destacados del Colegio Internacional de Cirujanos.

Los autores que dessen enviar artículos para su publicación en el *Journal*, deben consultar la página de ésta revista dedicada a "Información General", para conocer los NUEVOS requerimientos editoriales.

Homenaje al Presidente de la Asociación Médica de Puerto Rico.—En fecha reciente, los médicos graduados de la Escuela de Medicina de Boston ofrecieron una comida en honor del Dr. Carlos E. Muñoz MacCormick, para festejar sus éxitos como Presidente de la Asociación Médica de Puerto Rico.

Segundo Congreso Mejicano del Cáncer.—En la Republica Mejicana se celebrará durante los dias 3 al 9 de Febrero el Segundo Congreso Mejicano del Cáncer.

Sociedad de Cirugía del Uruguay.—En los meses pasados presentó ante ésta Sociedad una interesante comunicación el Dr. Domingo Prat cuyo tema fué el tratamiento de la colecistitis aguda, explicando sus puntos de vista sobre el problema admiendo la división establecida por los cirujanos con fines prácticos en colecistitis aguda simple y colecistitis aguda grave. Intervinieron en las discusión los Drs. Soto Blanco, Loubejac y Anavitarte.

Segundo Congreso Sudamericano de Neurocirugía.—Se caba de anunciar que el Segundo Congreso Sudamericano de Neurocirugía tendrá lugar en Abril de 1947 en Santiago de Chile. El Dr. Alfonso Asenjo al comunicar los primeros detalles de esta reunión científica afirmo que las discusiones de la Asamblea versaran sobre temas incluidos en estos tres grupos: (1) Hidrocéfalo; (2) Histologia de los Tumores Cerebrales en Relación con los Hallazgos Clínicos y (3) Abscesos del Cerebro. Este facultativo dijo que espera que la reunión se vea honrada con la presencia de los mas eminentes neurocirujanos de todo el mundo con vistas a la organización de futuros Congresos Internacionales que podrian tener lugar, a intervalos de cinco años, en diferentes países.

Para mayor información perede escriberseal Dr. Arenjo, Secretario General del Comité Ejecutivo Director del Instituto Central de Neurocirugía, Pabelón Cushing, Santiago, Chile.

Donativos de Urgente Necesidad.—Un grupo de esposas de cientificos americanos han hecho un llamamiento para que se hagan donativos de ropas de abrigo y de zapatos y otros articulos de primera necesidad—especialmente para niños—a fin de enviarlos directamente a hombres de ciencia y sus familias en las zonas desvastadas por la guerra. "Un paquete de este tipo enviado este primavera vale más que uno mandado seis meses más tarde." Para información deben dirigirse a Grace S. Smith, National Bureau of Standards.

Perú.—El Dr. Francisco Graña, F.I.C.S. (Hon.), Vicepresidente del Colegio Internacional de Cirujanos, ha sido elegido Presidente de la Academia Nacional de Medicina; asimismo, fué elegido Miembro Honorario de la Academia Nacional de Medicina de Buenos Aires. El Dr. Fortunato Quesada, F.I.C.S., fué elegido Vicepresidente de la Academia Nacional de Medicina de Lima.

Uruguay.—El Dr. Domingo Prat, F.I.C.A., fué elegido Presidente de la Sociedad Nacional de Cirugía.

Venezuela.—El Dr. Domingo Luciani, F.I.C.S., fué elegido Presidente de la Sociedad Venozolana de Cirugía.